

AUSTRALIA

Patents Act 1990

NOTICE OF ENTITLEMENT

We, ROVEMA VERPACKUNGSMASCHINEN GmbH, Postfach 20, D-6301 Fernwald-Annerod, Federal Republic of Germany, state the following in connection with Australian Application No. 72291/91:

1. The nominated person is the assignee of the actual inventor(s).
2. The nominated person is the applicant of the basic application.
3. The basic application is the application first made in a Convention country in respect of the invention.

Dated: 17 September 1991

By PHILLIPS ORMONDE & FITZPATRICK
Patent Attorneys for the Applicant
By:

David B Fitzpatrick
.....

To: The Commissioner of Patents

Our Ref: 228869

2223n

72291/91



PC1 ANNOUNCEMENT OF THE LATER PUBLICATION OF AMENDED CLAIMS (AND, WHERE APPLICABLE, STATEMENT UNDER ARTICLE 19) INTERNATIONALES ANMELDEUNGSPROZEDUREVEREINBARUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

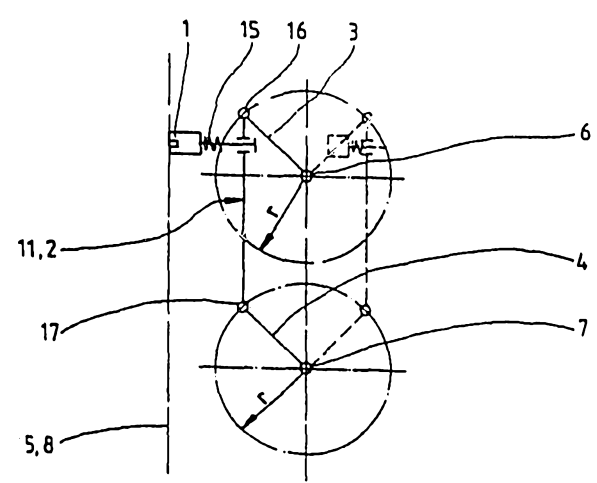
(51) Internationale Patentklassifikation 5 : B65B 51/30	A1	(11) Internationale Veröffentlichungsnummer: WO 91/12177 (43) Internationales Veröffentlichungsdatum: 22. August 1991 (22.08.91)
<p>(21) Internationales Aktenzeichen: PCT/DE91/00122</p> <p>(22) Internationales Anmeldedatum: 18. Februar 1991 (18.02.91)</p> <p>(30) Prioritätsdaten: P 40 05 078.5 17. Februar 1990 (17.02.90) DE</p> <p>(71) Anmelder (für alle Bestimmungsstaaten ausser US): ROVEMA VERPACKUNGSMASCHINEN GMBH [DE/DE]; Postfach 20, D-6301 Fernwald-Annerod (DE).</p> <p>(72) Erfinder; und (75) Erfinder/Anmelder (nur für US) : KAMMLER, Roman [DE/DE]; Philosophenstrasse 27a, D-6520 Worms 1 (DE).</p> <p>(74) Anwalt: MISSLING, A.; Bismarckstraße 43, D-6300 Gießen (DE).</p>	<p>(81) Bestimmungsstaaten: AT (europäisches Patent), AU, BE (europäisches Patent), CH (europäisches Patent), DE (europäisches Patent), DK (europäisches Patent), ES (europäisches Patent), FR (europäisches Patent), GB (europäisches Patent), GR (europäisches Patent), IT (europäisches Patent), LU (europäisches Patent), NL (europäisches Patent), SE (europäisches Patent), SU, US.</p> <p>Veröffentlicht <i>Mit internationalem Recherchenbericht.</i> <i>Mit geänderten Ansprüchen.</i></p> <p>Veröffentlichungsdatum der geänderten Ansprüche: 17. Oktober 1991 (17.10.91)</p> <p style="font-size: 2em; text-align: center;">641984</p>	

(54) Title: **DEVICE FOR MANUFACTURING BAGS FROM A THERMALLY WELDABLE STRIP, AND FOR FILLING AND SEALING SUCH BAGS**

(54) Bezeichnung: **VORRICHTUNG ZUM HERSTELLEN, FÜLLEN UND VERSCHLIESSEN VON BEUTELN AUS EINEM HEISSVERSIEGELBAREN BAND**

(57) Abstract

Prior art devices of this kind use cross-welding stations in which, because of the transverse motion of the welding heads (1), it is not possible to adjust the weld path, nor is it possible to increase the production speed. In order to avoid these disadvantages, the invention proposes that the transverse welding heads (1) be mounted on a carrier (2) connected to two parallel guide-rods (3, 4) which rotate about two parallel axes (6, 7) at right angles to the centreline (5) of the bag strip, thus forming a four-bar linkage.



(57) Zusammenfassung

Die Erfindung bezieht sich auf eine Vorrichtung zum Herstellen, Füllen und Verschliessen von Beuteln aus einem heissversiegelbaren Band. Bei bekannten Vorrichtungen werden Quersiegelstationen verwendet, bei welchen, bedingt durch die Bewegung der Querschweissbaken (1) zum einen keine Einstellung des Schweissweges möglich ist und zum anderen die Produktionsgeschwindigkeit nicht gesteigert werden kann. Um diese Nachteile zu vermeiden ist erfindungsgemäss vorgesehen, dass die Querschweissbake (1) an einem Träger (2) gelagert ist, welcher mit zwei Parallel-Lenkeranordnungen (3, 4) verbunden ist, welche um zwei zueinander parallele, senkrecht zur Mittellinie (5) des Schlauchs angeordnete Achsen (6, 7) zur Ausbildung eines Viergelenkmechanismus schwenkbar sind.

AN APPARATUS FOR THE MANUFACTURE,
FILLING AND CLOSING OF BAGS
MADE FROM A HEAT-SEALABLE SHEET

Description

The invention relates to an apparatus for the manufacture, filling and closing of bags made from a heat-sealable sheet utilizing means to form a tube from the sheet, a fill pipe and a cross-sealing station, which includes at least two cyclically movable cross-sealing jaws arranged on opposite sides of the tube.

Many types of such tubular bag machines are known from the state of the art. The basic principle is thereby that a foil strip is guided over a shaping
10 shoulder so that the edges of the foil strip overlap and can be welded to form a tube by means of a longitudinal welding device. The forming shoulder is connected to a fill pipe so that the goods to be packaged can be filled, mostly from above, through the fill pipe into the tube. In order to seal and to close the individual tubular bags, a cross-sealing station exists below the fill pipe, which is equipped with cross-welding jaws transversely movable with respect to the direction of movement of the tubular bag. The cross-welding jaws are
20 moved in cyclical intervals against one another in order to produce in this manner the respective lower and also

upper cross weldings of the bag. The cross-welding jaws must be moved since otherwise the respective next bag could not be moved on.

To move the cross-welding jaws, various principle solutions have been developed. One solution is to move the two cross-welding jaws laterally back and forth, namely to shift them translatorically. This solution is disadvantageous because a reversal of the direction of the cross-welding jaws is needed and thus the cycle frequency is limited.

10

A technically different solution is to support the cross-welding jaws each on a rotatable support, as this has been realized in the apparatus described in DE-PS 22 24 701. A similar solution is also shown in DE-PS 31 41 431. The disadvantage in these rotating sealing jaws is that these can contact one another only for a very short period of time so that the available sealing time is very short. This has the result that these apparatus can be used only in a limited field and do not permit an increase in the production speed.

20

In order to handle the problem of the relatively short sealing time with the rotatably supported cross-sealing jaws, it has been suggested to guide the jaws in a curved sector, which extends at least partly parallel with respect to the direction of movement of the tubular bag. Such a D-shaped curve is known from DE-PS 22 24 407. It is possible thereby to somewhat increase the sealing time, however, the guiding of the cross-sealing jaws in the D-shaped curve causes considerable accelerations and delays of the cross-welding jaw during one rotation so that relatively high mechanical stresses result. The result in turn is that the production speed cannot be increased as desired and that a relatively high degree of technology is required.

30

A further, additional disadvantage of the known solutions using rotating cross-sealing jaws is that the cross-sealing station, in particular in the direction of

movement of the bag, has relatively large dimensions so that it is not possible with common machine sizes to provide additional apparatus, for example a device for the manufacture of a so-called block base, which permits the tubular bag to be stored in an upright position.

According to the present invention there is provided an apparatus for the purpose previously described, whereby each cross-sealing jaw is supported on a support, which is connected to two drivable parallel control arrangements, which are pivotal about stationary axles which are parallel to one another and are arranged perpendicularly with respect to the centerline of the tube, in order to define a four-bar mechanism.

The apparatus of the invention may provide a

15

20

25

30

35

40



~~movement of the bag, has relatively large dimensions so~~
that it is not possible with common machine sizes to
provide additional apparatus, for example a device for
the manufacture of a so-called block base, which permits
the tubular bag to be stored in an upright position.

10 The basic purpose of the invention is to provide an
apparatus of the above-mentioned type, which with a
simple design and safe operation enables an extension of
the sealing time with an increase in the production
speed, has small dimensions and the possibility of
easily arranging additional apparatus for special bags
or special welding procedures.

This purpose is attained according to the invention
by the cross-welding jaw being supported on a support
which is connected to two parallel guide-bar arrange-
ments, which are pivotal about two parallel axles
arranged perpendicularly with respect to the centerline
of the tube to define a four-bar mechanism.

20 ~~The apparatus of the invention is distinguished by a~~
number of significant advantages. Since with the use of
the four-bar mechanism the support together with the
cross-welding jaw is not tilted relative to the center-
line of the tube or rather to the center plane of the
cross-welding connections, it is possible to carry out
the welding operation during the entire contact opera-
tion between the cross-welding jaw and the tubular-bag
material. Thus, there is no danger that the cross-
welding jaw tilts or is wedged or contacts the tubular-
bag material or separates from same at a not desired
30 angle. The cross-welding jaw thus carries out a cross
movement relative to the surface of the tubular-bag
material. The invention does not need curved sectors or
sliding rings so that the apparatus as a whole is
significantly simple in design and, compared with exist-
ing solutions, is not susceptible to breakdowns. A
particular advantage of the solution of the invention is
that the cross-welding jaws are moved rotatively by the

four-bar mechanism so that accelerations or delays in the movement of the cross-welding jaw do not occur. It is thus possible to move the cross-welding jaws basically at any desired rotational speed so that significant increases in the production speed are possible.

10 Furthermore, the invention is not limited to specific welding methods, it is rather possible to use any desired types of welding jaws. A further advantage of the simple design of the direction of movement of the welding jaws is that the feeding of cooling medium is significantly simplified since rotations or tiltings of the cross-welding jaws do not occur and since the space for movement of the cross-welding jaws is relatively freely accessible.

20 Due to the universal design capability of the cross-welding jaw and due to the fact that the sealing time can be adjusted as desired, the apparatus of the invention is suitable for all commonly used foils. Furthermore, it is favorable that a desired welding-jaw pressure can be adjusted (manually or automatically), for example, by supporting the cross-welding jaw movably or initially tensioned on the support in a manner which will be described in detail hereinafter.

30 Since the technical design of the apparatus is very simple and since in particular in the area of the cross-welding jaws only the four-bar mechanism is needed, the entire arrangement can have very small dimensions. Thus, it is also possible to use the sealing station of the invention in connection with further supplemental devices, for example with a block-base device.

A particularly favorable further development of the invention provides that the cross-welding jaw is movably supported on the support. The movement of the cross-welding jaw on the support enables the cross-welding jaw to be moved at a sufficient contact pressure against the opposite cross-welding jaw and to be initially tensioned

and to adjust a suitable welding path. Thus, a sufficient bearing on the tubular-bag material is assured.

10 It is furthermore advantageous according to the invention when the support is designed in the form of a plate arranged parallel to the center plane fixed by the centerline of the tube and the cross-welding jaw during the welding operation. The plate-like design of the support, on the one hand, simplifies the support of the cross-welding jaw, on the other hand, it is possible to connect the plate at its upper and lower ends directly to the four-bar mechanism so that only a small number of moved structural parts having a small mass exist.

20 In order to assure an even sealing pressure and in order to guarantee an even bearing of the cross-welding jaw against the tubular-bag material, the invention provides, as already mentioned, that the cross-welding jaw is movable perpendicularly with respect to the support and can be tensioned initially in direction of the center plane. The initial tension can, for example, be done by means of springs, while the mobility of the cross-welding jaw can be realized by connecting same to bolts supported in guideways on the support plate. It is furthermore advantageous to measure and manually or automatically adjust the contact pressure through sensors.

30 It is furthermore particularly advantageous according to the invention that additional structural elements, for example closing and removing elements, can be supported on the support so that in addition a closing and removing operation can be carried out. It is hereby also particularly advantageous that, due to the movement of the support, exact paths of movement of the closing and removing elements are given and the respective time of engagement with the bag material can be adjusted as desired. It is thereby possible for the closing and removing elements, similar to the cross-

welding jaw, to be supported also perpendicularly with respect to the support on the support and to be initially tensioned.

It is possible according to the invention to widely vary the four-bar design and to adjust same to the respective needs. Depending on the width of the sealing jaw, which can be changed as desired, it is possible to provide a parallel guide-bar arrangement on both sides of the sealing jaw, namely at the two ends of the support. It is also possible to support the support on an upper parallel guide-bar arrangement and to connect same to the lower parallel guide-bar arrangement only to guide and align the support. It is thus possible to design the support very narrowly and to further reduce the moved masses of the arrangement.

The parallel guide-bar arrangement is driven by providing same with a crank or crank disk, which can, for example, be equipped and can be balanced with balancing weights. A smooth running of the entire arrangement also at high rotational speeds is thus assured. The crank disks can be driven either by operatively connecting them each to a common drive axle or, however, it is also possible to connect only the one crank disk, on which the parallel guide-bar arrangement is mounted and which carries the support, to the drive axle and to operatively connect the other crank disk to the first crank disk. For a smooth running of the entire arrangement it is, of course, particularly favorable when the crank disks are driven at the same angular speed.

In order to adjust according to the invention the removing path and/or the sealing path and to adjust same to the respective requirements, it can be particularly advantageous when the distance of the two axles from the center plane of the tubular bag or the distance of the outer jaw surface from the fulcrum is changed. Thus, a shortening or extending of the path is obtained in

dependency of a springy support of the cross-welding jaw, during which, with the cross-welding jaw moving, same rests against the tubular-bag material.

The apparatus of the invention can be advantageously utilized both in horizontally and also vertically operating tubular-bagging machines.

The invention will be described hereinafter in connection with exemplary embodiments and the drawings, in which:

10 Figure 1 is a schematic side view of the basic principle of the cross-sealing station of the invention,

 Figure 2 is an enlarged, schematic partial view of the welding jaw and of the support,

 Figure 3 is a further schematic side view of the four-bar mechanism of the invention,

 Figure 4 is a further schematic side view of the four-bar mechanism,

 Figure 5 is a schematic cross-sectional view taken along the line V-V of Figure 4,

20 Figure 6 is a schematic side view of a further embodiment of a drive arrangement according to the invention, and

 Figure 7 are schematic side views of different drive arrangements,

 Figure 8 is a schematic front view of a block-base device,

 Figure 9 is a side view of the arrangement shown in Figure 8,

30 Figure 10 is a cross-sectional view corresponding with Figure 5, however, with a pressure-measuring sensor and a motor-driven jaw-adjusting device, and

 Figure 11 is a schematic side view of a further embodiment according to the invention for horizontal tubular bag machines.

 Figure 1 illustrates schematically the cross-sealing station of the invention. The left half of Figure 1 shows the centerline 5 of the tubular foil or rather the

center plane 8 traveled by a cross-sealing jaw 1 and the centerline 5 therefor. The cross-sealing jaw 1 is, as will be discussed in detail in connection with Figure 5, movably supported on a support 2 and is initially urged away from the support by means of a spring 15. The upper and the lower end of the support 2 are each provided with a joint 16, 17, to which are hinged an upper parallel guide-bar arrangement 3 and a lower parallel guide-bar arrangement 4. These in turn are respectively rotatably supported on an upper axle 6 and a lower axle 7 so that the joint axles of the joints 16 and 17 describe the circular paths described in Figure 1, when the support 2 is pivotally moved about the axle 6 or 7. The right half of the figure shows in dashes the position of the cross-sealing jaw 1 when it is swivelled to the rear.

10

Figure 2 illustrates in detail again the design of the arrangement schematically illustrated in Figure 1 and shows in particular that the swivel axles 6, 7 are stationarily supported.

20

Figure 2 illustrates furthermore schematically a tubular bag 18, which is sealed by means of the cross-sealing jaw 1. Figure 2 shows that an upper and a lower closing and removing element 9, 10 can also be supported on the support 2, which element is also movable relative to the support 2 and can be initially tensioned by means of springs. Thus, it is possible by means of the closing and removing element to stretch and align the material of the tubular bag 18 in a conventional manner prior to or while the cross-sealing jaw carries out the welding operation. It is thereby in particular possible according to the invention to select the relative speeds through a suitable adjustment of the speed of movement of the tubular bag 18 and of the speed of rotation of the cross-sealing jaw arrangement such that either no relative speed exists between the cross-sealing jaw and the tubular-bag material or that prior to the actual

30

start of the welding operation by means of a relative movement, a removing effect is caused by the closing and removing elements 9, 10.

10 Figure 3 shows again an enlarged detailed illustration of the arrangement, from which results in particular the circular path 20 of the front contact point 19 of the cross-sealing jaw 1. From the illustration according to Figure 3 can be seen furthermore how long the welding path 21 is, namely, over which path the cross-sealing jaw 1, caused by its movable support on the support 2, is guided on the center plane 8 or rather on the centerline 5. Furthermore, Figure 3 shows that through a simple change in the distance 22 between the centerline 5 or rather the center plane 8 and the plane extending through the axles 6, 7 or through a change in the distance 45 between the surface of the cross-sealing jaw (point 19) and the fulcrums (16, 17), the welding path 21 can be varied so that an especially simple
20 adjusting of the apparatus to different operating conditions is guaranteed. Figure 3 shows furthermore that the two parallel guide-bar arrangements 3, 4 are each connected to a crank disk 12, 13 or rather a similar element, with the crank disks 12, 13 being coupled through a drive 23 with one another such that the same angular speeds result.

30 Figure 4 shows again a schematic side view of the arrangement of the invention, from which results the drive of the crank disks 12, 13. It is possible to connect by means of a rotating drive 24, for example, a chain or a toothed belt, a drive axle 14 directly to both the upper crank disk 12 and also the lower crank disk 13. Figures 6 and 7 show as an alternative to these drives that all modifications assure that the same angular speeds about the axles 6, 7 result.

Figure 5 shows schematically a possible technical embodiment, which is partly already shown in Figure 4. The support 2 is thereby constructed in the form of a

narrow beam and is connected to connecting guide bars 11, which in turn are operatively connected to the lower parallel guide-bar arrangement 4. As is shown in Figure 5, the connecting guide bars 11 are mounted on the ends of the support 2. The connecting guide bars 11 are, as this can also be seen in Figure 5, connected to the respective crank disks 12 (or 13) by the suitable parallel guide-bar arrangements 3, 4 so that these can be rotated about the axles 6, 7. The housing and the respective supports will not be described in detail because the man skilled in the art is familiar with those based on his technical knowledge. One toothed-belt or chain sprocket 25 is fastened to each of the free ends of the axles 6, 7, which toothed-belt or chain sprocket is connected to a further toothed-belt or chain sprocket 27 by a toothed-belt or chain 26 or a similar drive element, which sprocket 27 in turn is supported on the drive axle 14. The drive takes place through a further in between gearing 28 and a drive motor 29. The gears 49 transfer the respective rotary movement onto the oppositely lying four-joint mechanism (not illustrated here) with the opposed cross-sealing jaw(s).

The movable support of the cross-sealing jaw 1 on the support 2 is realized by fastening bolts 30 to the cross-sealing jaw 1, which bolts are each movably supported in a guideway 31 on the support 2. The initial tension of the cross-sealing jaw 1 is done through the already described spring 15.

Figures 8 and 9 illustrate detailed views of the block-base device to be used ~~according to~~ ^{in one form of} the invention. Reference numeral 32 identifies the tubular foil in Figures 8 and 9. A mounting plate 33 exists below or rather at the lower end of the device, on which mounting plate 33 are mounted buffers 34. A cage 35 is supported above the buffers 34, which cage is used to receive the block-base bag 36. The illustration according to Figure 8 shows the turned bottom seam 37. The device has

furthermore in a conventional manner upper jaw carriers 38 which correspond with the supports 2 according to the above-described exemplary embodiments. The cross-sealing jaws 1 are supported on the supports 2. An air cooling system 39 and a block-base pin 40, which is also shown in the side view of Figure 9, exists furthermore above the cross-sealing jaws 1. The drive is done through a guide roller 41, which runs on a cam 42. A side-folding rod 44 is, aside from the block-base pin 40, also supported on a holder 43. The side-folding rod 44 is used to create in a conventional manner a side fold. The block-base device corresponds to the known state of the art and its operation does therefore not need to be described in detail. It is important according to the invention that the device, due to the low structural height of the cross-sealing station and the arrangement of the cross-sealing jaws, can be inserted in known machines below the machines.

10

Figure 10 illustrates schematically an expanded embodiment of the design of Figure 5. The sealing pressure is here adjusted and measured with the help of a measuring sensor 46, 47 having both a sensor 46 and a drive 47 to adjust the pressure. The welding path 21 is furthermore adjusted by the drive 48. With this design, it is possible to achieve an automatic sealing-pressure and sealing-path adjustment.

20

Figure 11 illustrates the use of an apparatus of the invention in a horizontally operating packaging machine. It is advantageous here to arrange several pairs of cross-sealing jaws 1 one behind the other, thus significantly increasing the output. The foil 32 envelopes the product 50 to be packaged and already arranged in defined intervals. The foil is first longitudinally welded to form a tube and is thereafter cross-welded by means of cross-sealing jaws 1. The packaged bags 51 are continuously discharged. Thus, the operation corresponds with the vertical design, with the

30

difference that the connecting guide bars 11 are here also horizontally arranged.

The invention is not to be limited to the illustrated exemplary embodiments, rather many possibilities for modifications within the scope of the invention result for the man skilled in the art.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An apparatus for the manufacture, filling and closing of bags made from a heat-sealable sheet utilizing means for forming a tube out of said sheet, a filling mechanism and a cross-sealing station, which includes at least two cyclically movable cross-sealing jaws arranged on opposite sides of the tube, wherein each cross-sealing jaw is supported on a support, which is connected to two drivable parallel control arrangements, which are pivotal about stationary axles which are parallel to one another and are arranged perpendicularly with respect to the centerline of the tube, in order to define a four-bar mechanism.

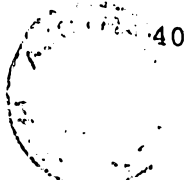
2. An apparatus according to Claim 1, wherein each cross-sealing jaw is movably supported on the respective support.

3. An apparatus according to Claim 1 or 2, wherein each support is constructed in the form of a plate arranged parallel with respect to a center plane fixed by the center-line of the tube and the cross-sealing jaw during the welding operation.

4. An apparatus according to Claim 3, wherein the cross-sealing jaw is perpendicularly movable with respect to the support and is initially tensioned in the direction of said center plane.

5. An apparatus according to any one of Claims 1 to 4, wherein the cross-sealing jaw is supported substantially centrally on the support and that on both sides of the cross-sealing jaw there are arranged parallel to said cross-sealing jaw closing and removing elements on the support.

6. An apparatus according to Claim 5, wherein the closing and removing elements are perpendicularly movable



with respect to the support and are initially tensioned in the direction of said center plane.

5 7. An apparatus according to any one of Claims 1 to 6, wherein the support is supported on an upper parallel guide-bar arrangement and that the upper parallel guide-bar arrangement is connected to a lower parallel guide-bar arrangement by means of a connecting guide bar.

10 8. An apparatus according to any one of Claims 1 to 7, wherein on both sides of the support there is provided a parallel guide-bar arrangement.

15 9. An apparatus according to any one of Claims 1 to 8, wherein the parallel control arrangements are supported on the stationary axles by means of cranks or crank disks.

20 10. An apparatus according to Claim 9, wherein the cranks or crank disks are operatively connected to a common drive axle.

25 11. An apparatus according to Claim 9 wherein the cranks or crank disks of an upper parallel guide-bar arrangement of the parallel control arrangements is operatively connected to a drive axle and to a crank disk of a lower parallel guide-bar arrangement of the parallel control arrangements.

30 12. An apparatus according to any one of Claims 9 to 11, wherein the crank disks are driven at the same angular speed.

35 13. An apparatus according to any one of Claims 1 to 12, wherein the support is moved in a sinusoidal movement perpendicularly with respect to the tubular bag centerline.

40 14. An apparatus according to any one of Claims 1 to 12, wherein the removing path and/or the sealing path is adjustable by changing the distance of the stationary

axles from the center plane.

5 15. An apparatus according to any one of Claims 1 to 14,
wherein the cross-sealing station is followed by a block-
base station.

10 16. An apparatus according to any one of Claims 1 to 15,
wherein each cross-sealing jaw is supported by a measuring
sensor on the support to determine the contact pressure.

17. An apparatus according to any one of Claims 1 to 16,
wherein the distance of each cross-sealing jaw to its
support can be adjusted by an adjusting device.

15 18. An apparatus according to Claim 17, wherein the
adjustment of the sealing jaw is done in dependency of the
sealing pressure.

20 19. An apparatus according to any one of Claims 1 to 18,
wherein the jaw path and thus the welding path can be
changed by changing the distance represented by "r"
(Figure 2), the distance represented by (22) of the
stationary axles and/or by the distance represented by
(45) (Figure 3).

25 20. An apparatus according to claim 1, substantially as
herein described with reference to any one of the embodi-
ments thereof as illustrated in the accompanying drawings.

30 DATED: 14 July 1993
PHILLIPS ORMONDE & FITZPATRICK
Attorneys for:
ROVEMA VERPACKUNGSMASCHINEN GmbH

David B Fitzpatrick

35

40 6004Z

Abstract

The invention relates to an apparatus for the manufacture, filling and closing of bags made of a heat-sealable sheet. Known apparatus use cross-sealing stations in which, caused by the movement of the cross-welding jaws (1), on the one hand, an adjustment of the welding path is not possible and, on the other hand, the production speed cannot be increased. In order to avoid these disadvantages, the invention provides that the cross-welding jaw (1) is supported on a support (2) which is connected to two parallel guide-bar arrangements (3, 4), which are pivotal about two parallel axles (6, 7) arranged perpendicularly with respect to the centerline (5) of the tube to define a four-bar mechanism. (Figure 1)

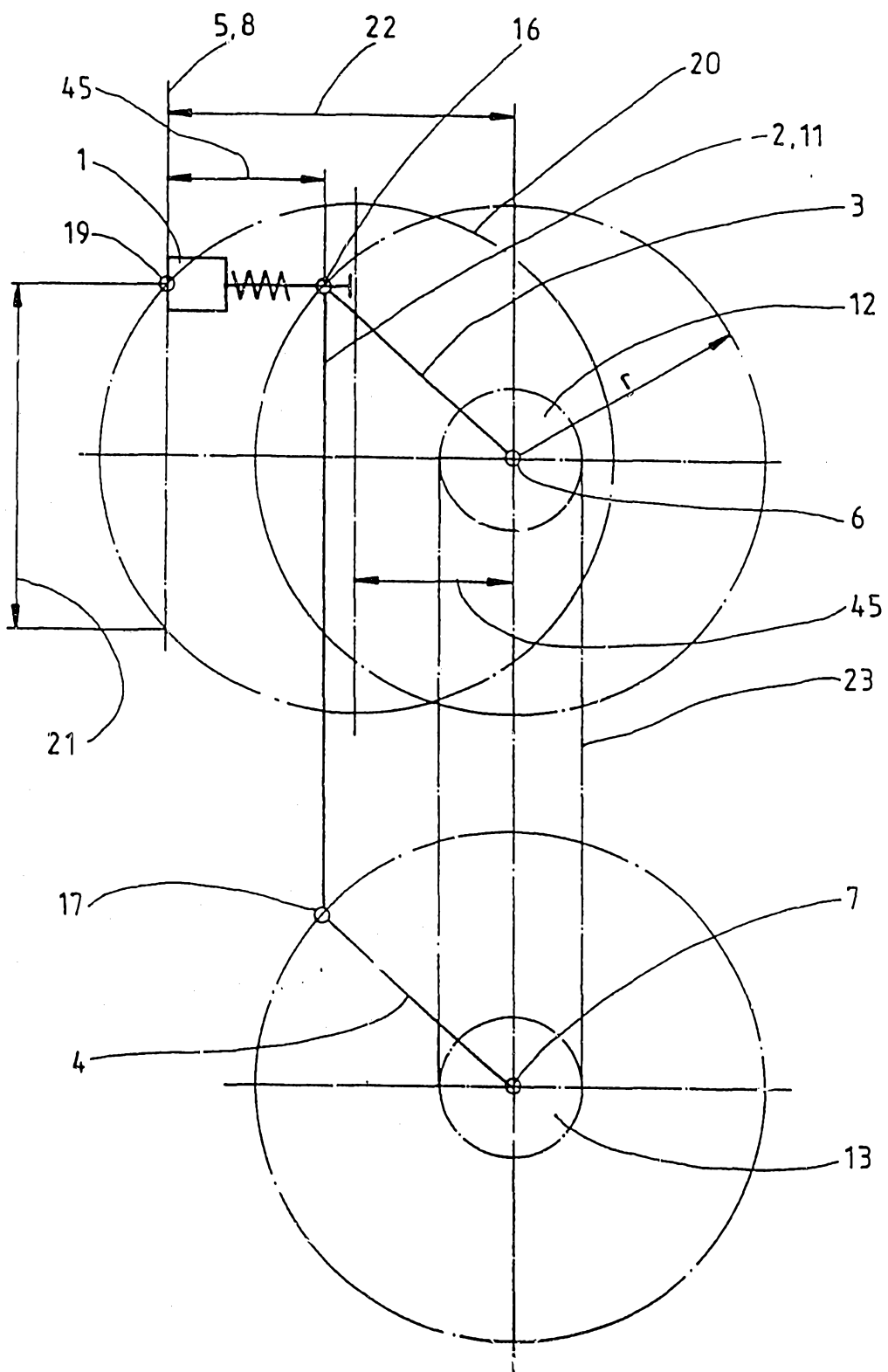


Fig.3

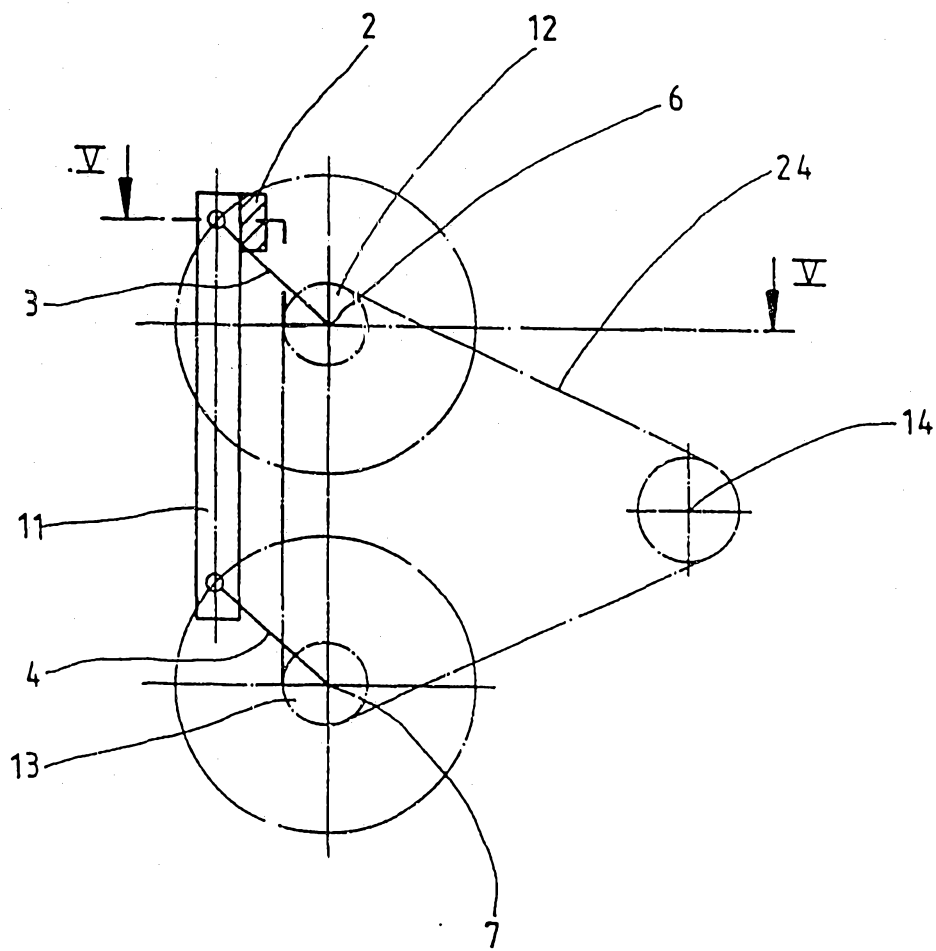


Fig. 4

ERSATZBLATT

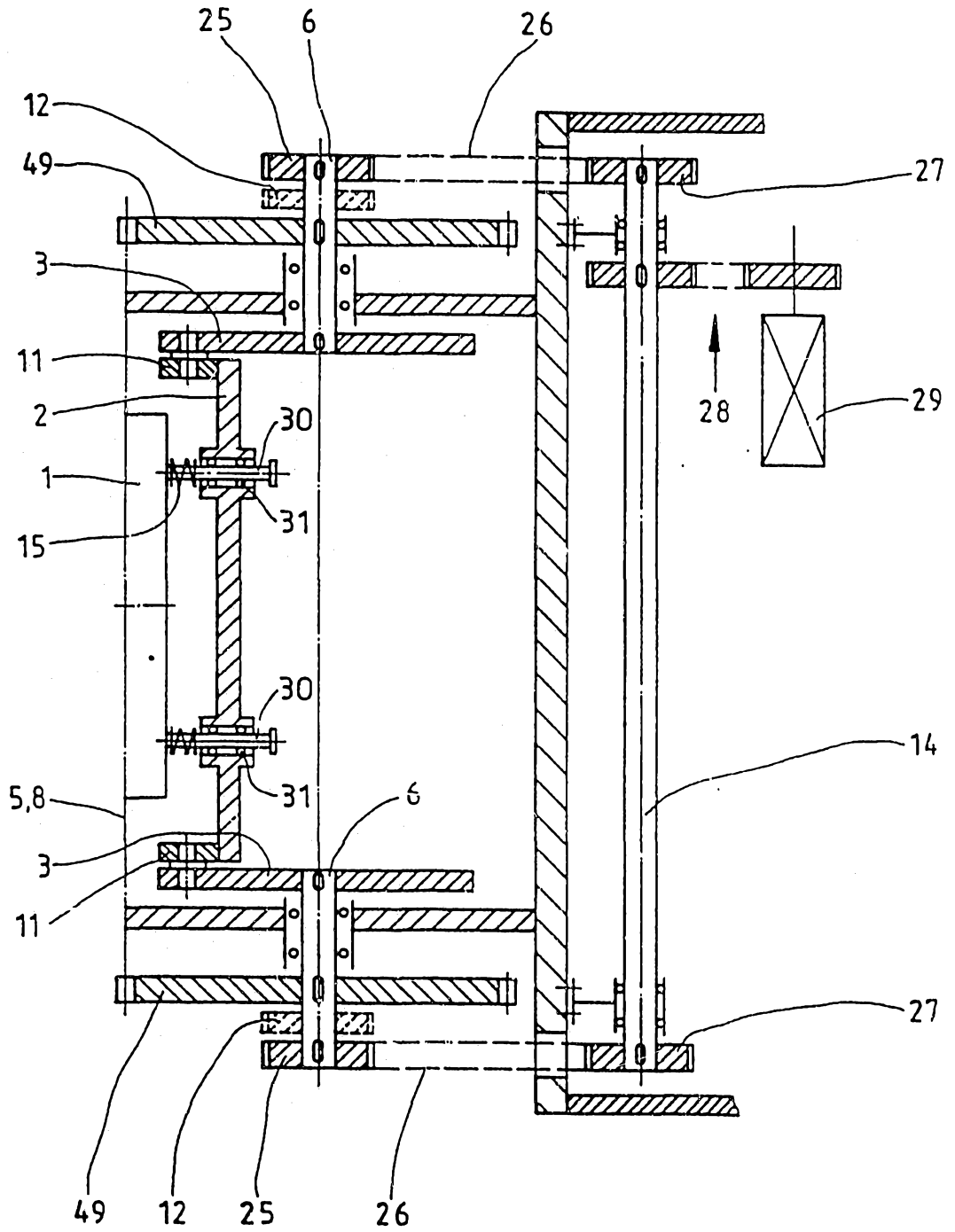


Fig. 5 ERSATZBLATT

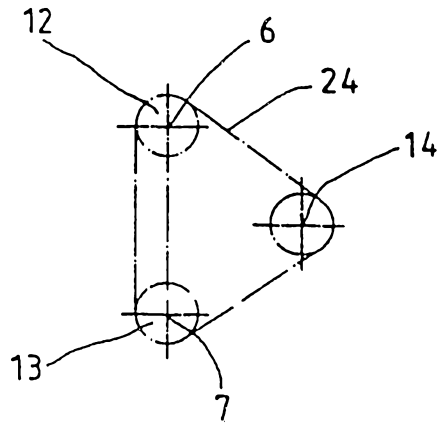


Fig. 6

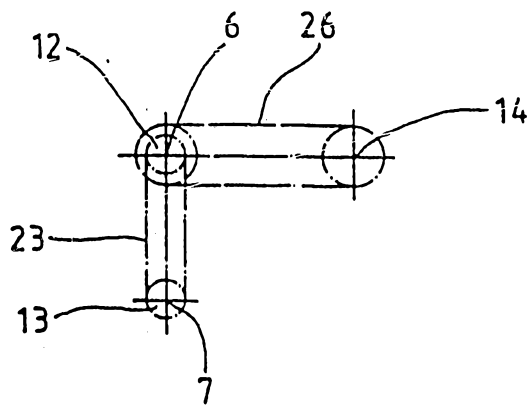


Fig. 7
ERSATZBLATT

6/8

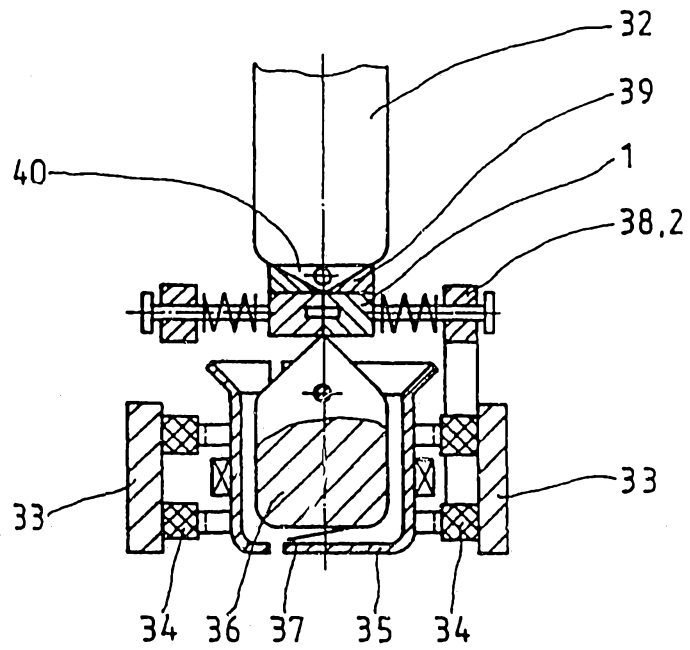


Fig.8

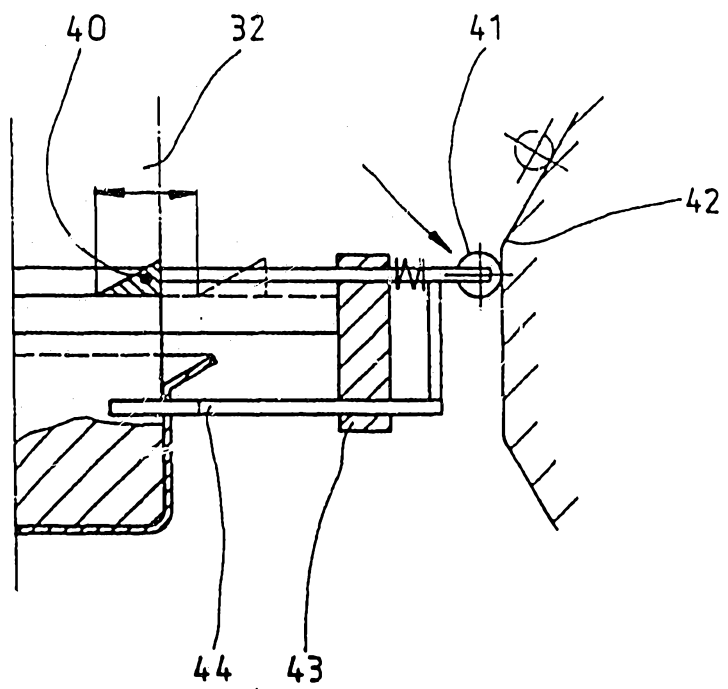


Fig.9
ERSATZBLATT

INTERNATIONAL SEARCH REPORT

International Application No PCT/DE 91/00122

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶				
According to International Patent Classification (IPC) or to both National Classification and IPC				
Int.Cl. ⁵ B 65 B 51/30				
II. FIELDS SEARCHED				
Minimum Documentation Searched ⁷				
Classifier System	Classification Symbols			
Int.Cl. ⁵ B 65 B				
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸				
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹				
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³		
X	CH, A, 433100 (HESSER) 30 September 1967, see the whole document	1,3,7-10,13		
Y		2,4-6,15,17		
Y	FR, A, 2106682 (PRATT) 5 May 1972, see page 3, lines 4-33; figure 2	2,4,17		
Y	FR, A, 1329553 (FABRITIUS) 6 May 1963, see page 2, column 1, lines 9-47; figures 1-3	5,6		
Y	DE, A, 1815029 (MIRA-PAK) 24 July 1969, see figs. 1-6	15		
A	CH, A, 531440 (HESSER) 31 January 1973, see column 2, line 31 - column 3, line 15; figures	1		
A	FR, A, 2512777 (MAPA) 18 March 1983, see claim 1; figure 1 (cited in the application)	1		

<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date or another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%; vertical-align: top;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </td> </tr> </table>			<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date or another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>
<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date or another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p>			
IV. CERTIFICATION				
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report			
22 April 1991 (22.04.91)	20 June 1991 (20.06.91)			
International Searching Authority	Signature of Authorized Officer			
European Patent Office				

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

DE 9100122
SA 44423

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 04/06/91. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CH-A- 433100		None	
FR-A- 2106682	05-05-72	None	
FR-A- 1329553		None	
DE-A- 1815029	24-07-69	CH-A- 498002 FR-A- 1579991 GB-A- 1223879 US-A- 3543467	31-10-70 29-08-69 03-03-71 01-12-70
CH-A- 531440	15-12-72	DE-A- 2113270 GB-A- 1345455	26-10-72 30-01-74
FR-A- 2512777	18-03-83	DE-A, C 3141431 GB-A, B 2109330 US-A- 4524567	31-03-83 02-06-83 25-06-85

EPO FORM 10479

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82