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None

(58) Field of search

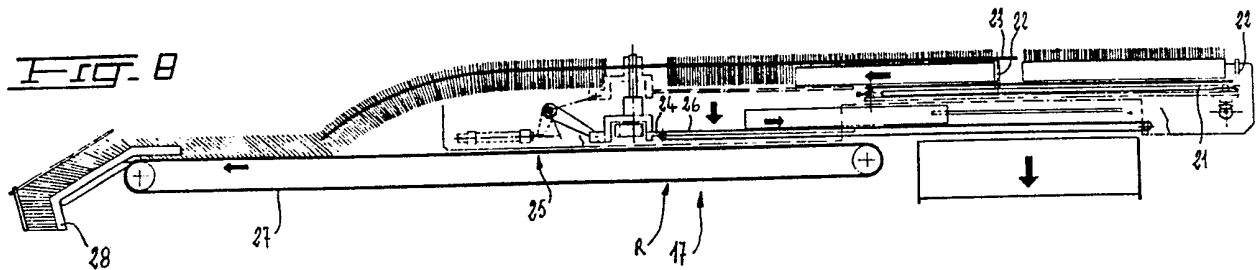
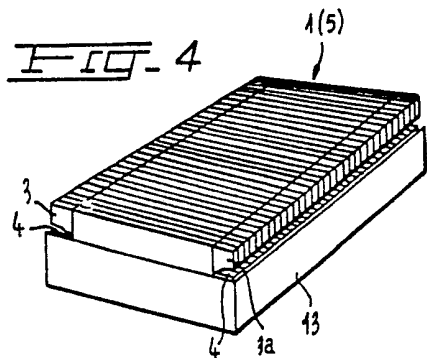
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(54) System for feeding flat folded tubular packing containers

(57) A system for feeding packing containers, prefabricated in flattened folded tubular form, to a packing machine equipped with a short vertical feed magazine (28) in which the containers have notches (4) defining preparatory and closing members, comprises positioning the flat folded containers sideways in trays, and feeding the trays towards the short vertical magazine. Fixed guide rails (23) engage the notches of the containers, and the trays are then lowered to leave the containers slidably suspended from the rails. The suspended containers are thrust by the succeeding trays towards and into the said short vertical magazine, while the empty trays are conveyed to a discharge and collecting station.



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FIG. 1

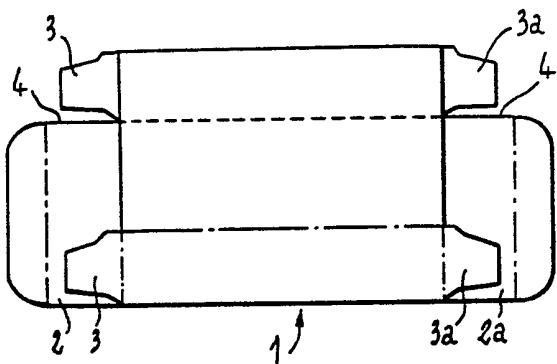


FIG. 2

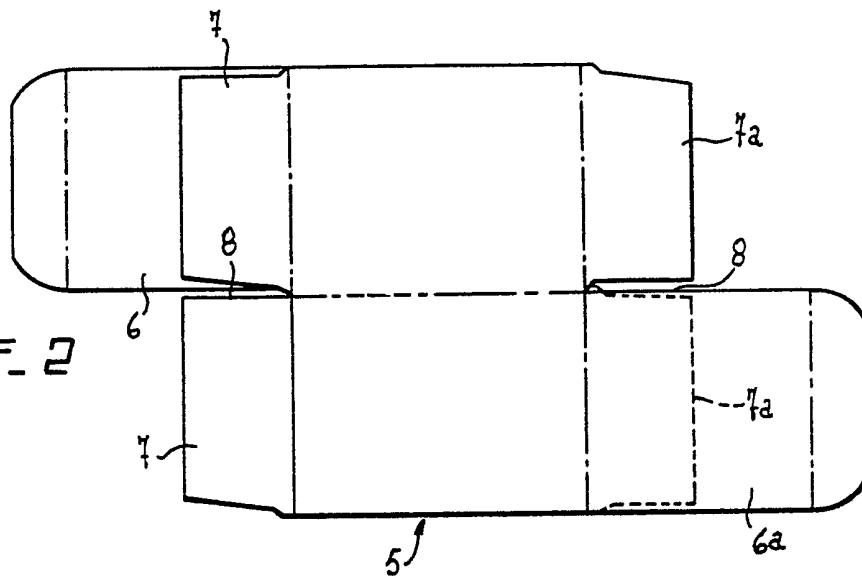


FIG. 3

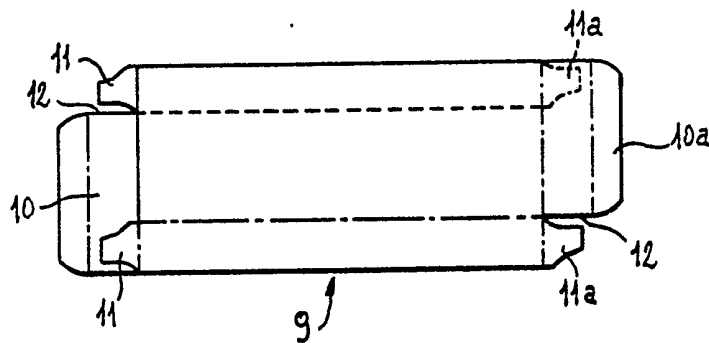


FIG. 4

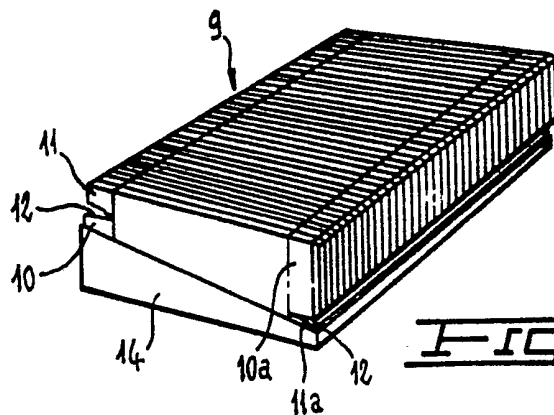
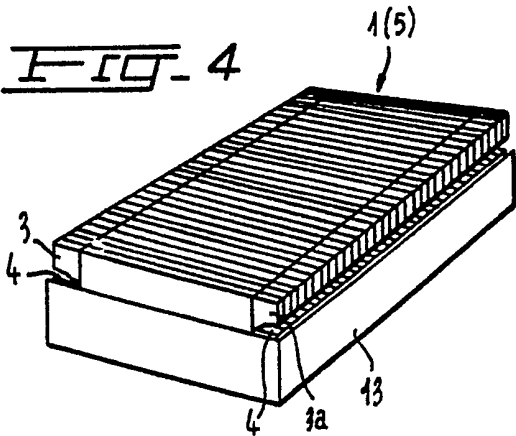


FIG. 5

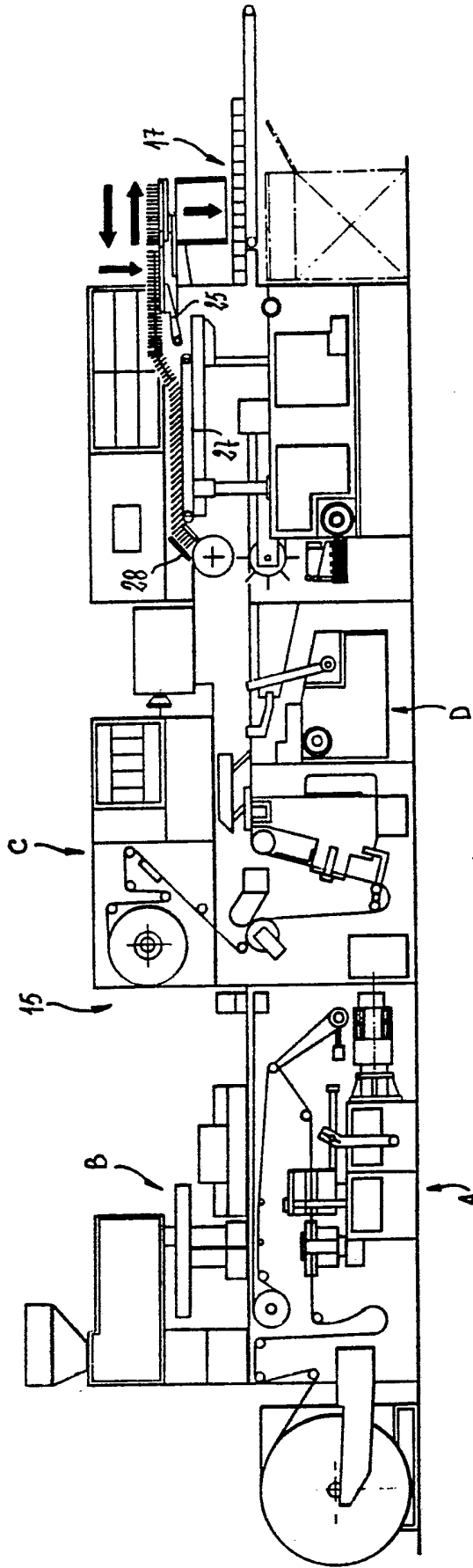


FIG- 6

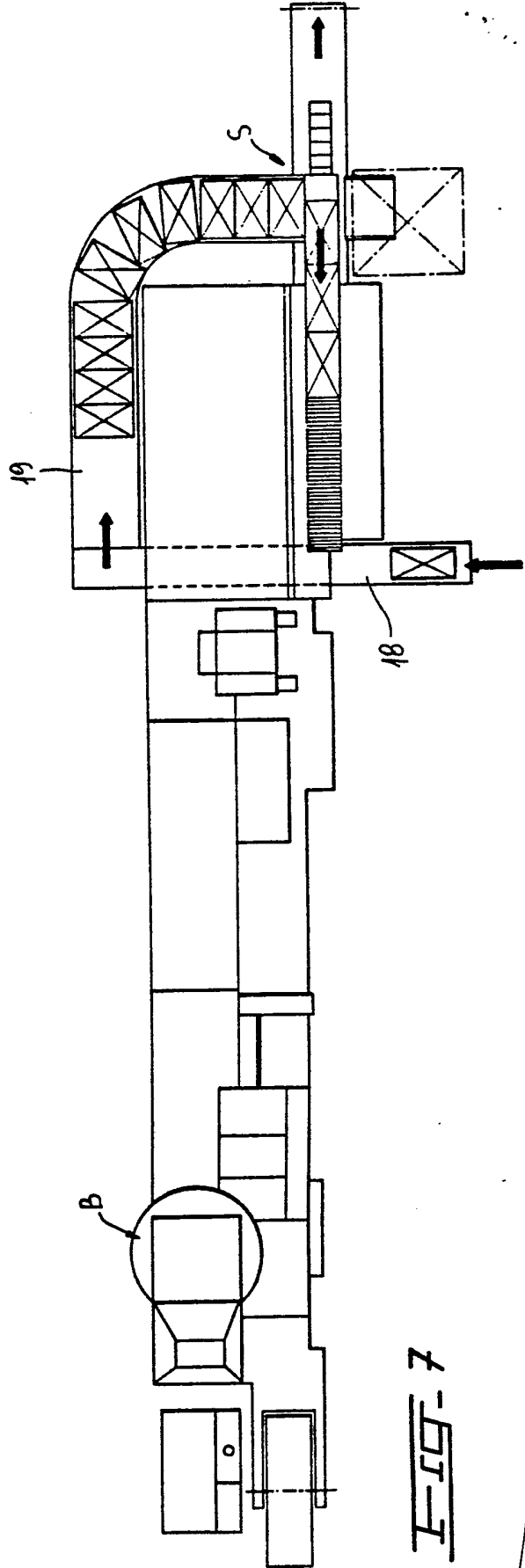


FIG- 7

FIG. 8

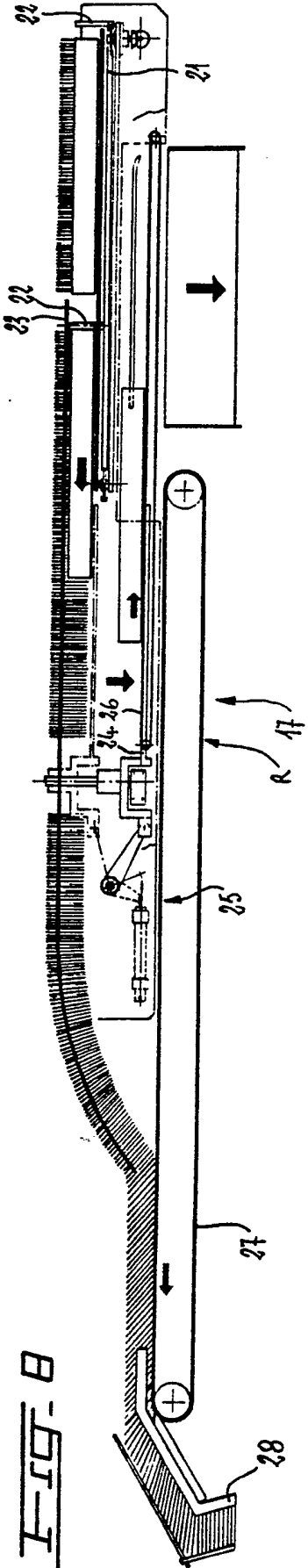


FIG. 9

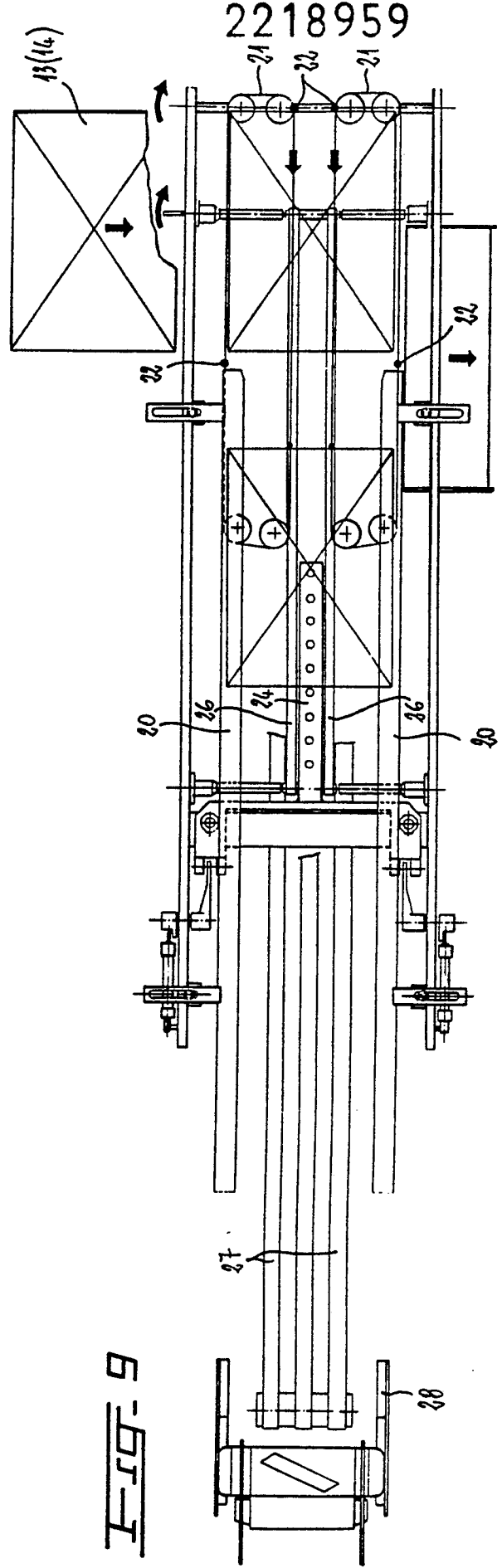


FIG. 10

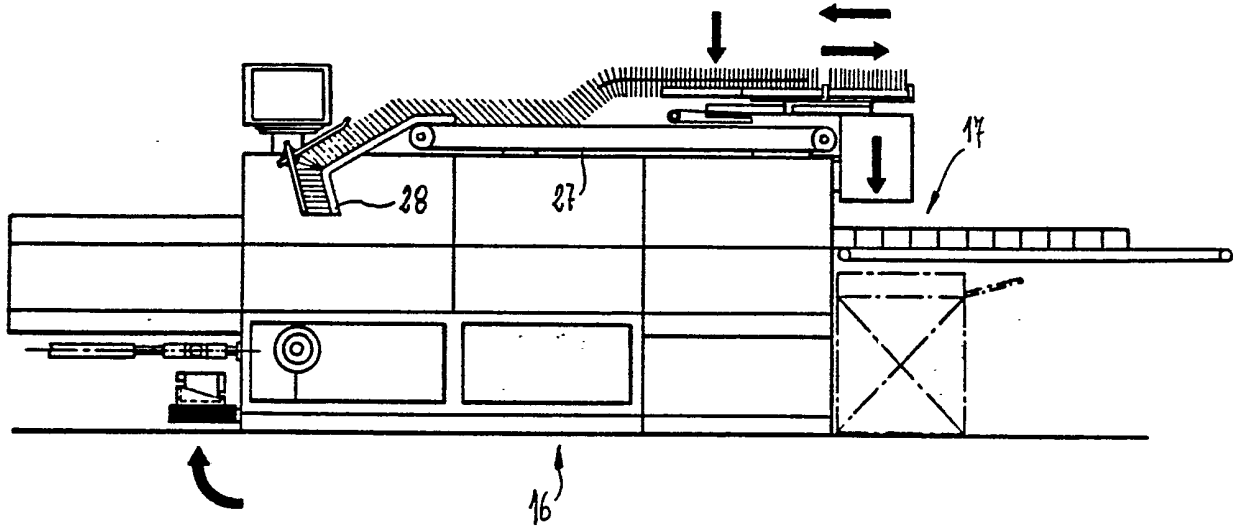
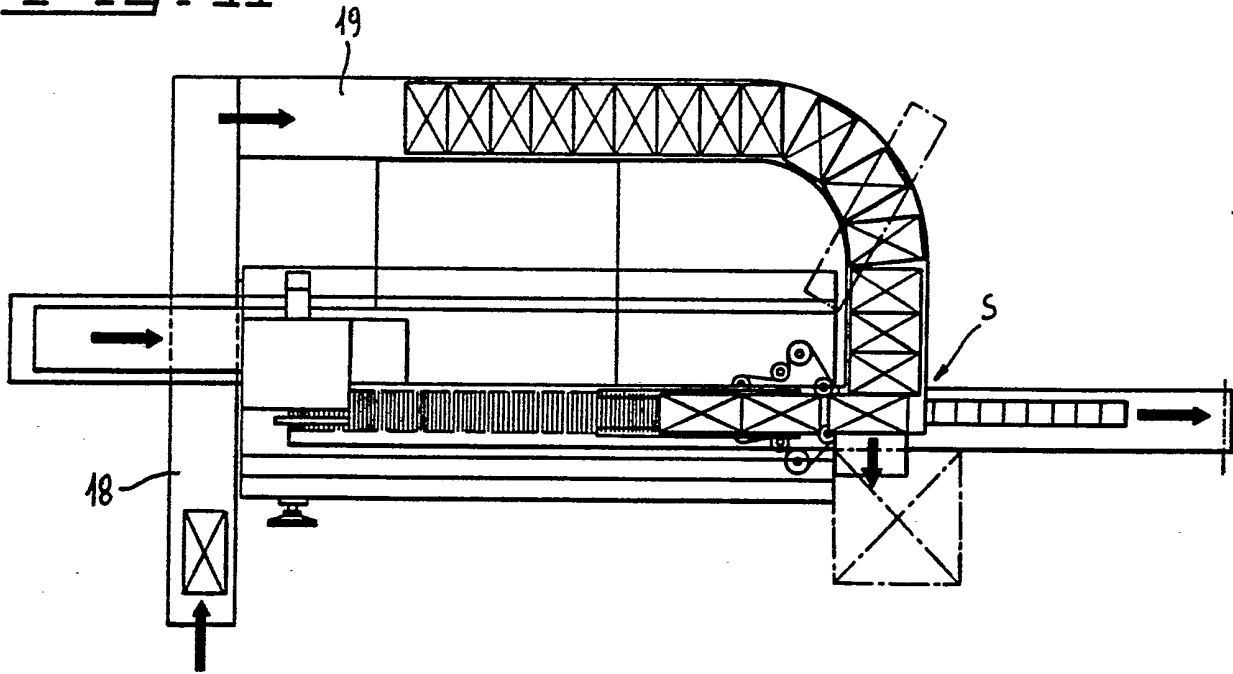


FIG. 11



SYSTEM FOR FEEDING FLAT FOLDED TUBULAR PACKING CONTAINERS

The present invention relates to a system for feeding  
packing containers, prefabricated in a flattened folded  
5 tubular form, to a packing machine.

The flattened folded tubular containers are produced, as is  
known, from recessed sheets of cardboard each of which is  
provided, in transverse and longitudinal rows or strips,  
10 with a plurality of flat shaped parts interconnected by  
fracturing staples. The flat shaped parts are notched to  
define the preparatory members for the tubular form, after  
which the staples are fractured and the sheets divided into  
the separate flat shaped parts for palletization in  
15 superimposed layers. The flat blanks are thus arranged in  
multiple piles resting against one another transversely and  
longitudinally. The piles of blanks are then normally  
supplied in succession by hand to a feed reservoir or  
hopper from which the blanks are automatically collected  
20 one by one and fed to a machine which piles or stacks them  
in boxes.

In the preparation and packing of pharmaceutical and  
similar products, this type of prefabricated flat folded  
25 tubular container is often adopted. The containers are  
known as "knock-down cartons" and, due to the ease with  
which they can slide, the flat blanks are generally fed to  
the relevant packing machines by taking them individually  
and in succession from underneath a short vertical magazine  
30 or hopper in which they are piled manually one by one.  
Subsequently, the flat blanks are erected to form tubular  
containers which are filled with the product to be packed,  
and the opposed ends of the container are then closed.

35 Owing to the gradually increasing production rate achieved  
with these packing machines, it has been proposed to  
automatically feed this short vertical magazine with the

flat folded blanks via a high-capacity magazine in which the blanks are positioned sideways in a long substantially horizontal row in such a way as to transfer them by a fan-type or rather weir-type control system. Such a system is described, for example, in US Patent 3,665,072. The provision of this reserve capacity for supplying blanks to the short vertical magazine when required, does not altogether eliminate the need for manual work but nevertheless reduces the frequency with which it is required.

In the present specification, there is disclosed a system which eliminates altogether manual replenishing of the short vertical magazine. The system is designed to replenish the short vertical magazine without any break in continuity using automatic devices which, in turn, can be designed either for intermittent or for continuous motion in a particularly simple manner and with a high rate of productivity and at a low cost.

According to the present invention, there is provided a system for feeding packing containers, prefabricated in a flat folded tubular form, to a packing machine, the system comprising: means for conveying the flat folded containers in discrete bunches between a pair of elongate, parallel guide members, the containers in each bunch being transversely arranged one behind the other and each having a pair of longitudinally opposed notches for slidably engaging the respective guide members, the notches at least partly defining the end closure members of the container, and the containers in each bunch subsequently being slidably advanced along the guide members toward a storage magazine in response to the next succeeding bunch being conveyed between the guide members.

The conveying means preferably comprises a plurality of trays for retaining the respective bunches, and means for

sequentially advancing the trays between the guide members, each tray having lateral retaining walls of such a height that the pair of notches are left exposed. Accordingly, as the trays are removed one by one after the containers have  
5 slidably engaged the guide members, the containers remain slidably suspended from the guide members while the empty trays are conveyed to a discharge and collecting station.

Some examples of the invention will now be described with  
10 reference to the accompanying drawings, wherein:

Figs. 1, 2 and 3 show three types of prefabricated packing containers in their flat folded tubular form,

15 Figs. 4 and 5 show the containers of the types illustrated in Figs. 1 and 3 arranged in trays,

Fig. 6 is a schematic longitudinal front view of a packing machine for "blister" type products, fitted with the  
20 apparatus designed to feed the machine with the packing containers of Figs. 1 to 3,

Fig. 7 is a schematic plan view of the packing machine and associated feed apparatus shown in fig. 6,  
25

Figs. 8 and 9 are schematic elevation and plan views respectively, on an enlarged scale, of the feed apparatus,

30 Figs. 10 and 11 illustrate, again in elevation and plan respectively, but in greater detail, the feed apparatus shown in Figs. 8 and 9.

Referring first to Figs, 1, 2 and 3 there is illustrated three types of packing container prefabricated in their  
35 flat folded tubular form. The container 1 in Fig. 1 has symmetrical closing flaps 2, 2a and 3, 3a defined by longitudinally aligned notches 4. The container 5 in Fig.



2 has closing flaps 6, 6a and 7, 7a asymmetrically defined by notches 8, again longitudinally aligned. The container 9 in fig. 3 has closing flaps 10, 10a and 11, 11a, again asymmetrical but defined by notches 12 not aligned  
5 longitudinally, owing to the different width of the opposite side walls or outer shell of the container.

The system for feeding the packing containers 1, 5 or 9 to the packing machines, provides cardboard trays 13, 14 for  
10 stacking the containers as they emerge from the machine by which they are given the flat folded tubular shape. The trays 13 and 14 have lateral retaining walls of a height such as to leave exposed at least two longitudinally opposite notches 4, 12 (figs. 4 and 5) defining the  
15 respective closing flaps 2, 2a, 3, 3a and 10, 10a, 11, 11a of the containers. The trays thus filled are individually and successively fed to a short vertical magazine of the packing machine between fixed rotary guides engaging the  
20 aforementioned longitudinally opposed notches. Along this feed path to the vertical magazine, the trays are lowered one by one to leave the containers in their flattened folded tubular form, slidably suspended on the fixed rotary guides, the suspended containers being thrust by the  
25 succeeding trays toward and into the short vertical magazine, while the empty trays are conveyed to a discharge and collecting station.

A system of this kind for feeding packing containers, prefabricated in a flat folded tubular form, to packing  
30 machines for the products in the containers, is in practice operated by an apparatus associated with one of the packing machines.

In Figs. 6 and 7 a feed system of this kind is shown  
35 associated with a packing machine 15 for "blister" products, the packing machine being manufactured and sold by the present applicants under the trade mark IMA and

bearing the code C65. A packing machine of this kind for "blister" products consists essentially, as shown in Fig. 6 and proceeding from the top downwards in respect of the direction taken by a strip of material being processed in order to obtain the "blister" products, a section A for drawing the band to provide cells or recesses (blisters) for receiving individual products to be packed, a section B for feeding the cells or recesses with the individual products to be packed, a section C for hermetically sealing the cells or recesses (each containing one of the products to be packed) by superimposing on the band a second band which can be welded to the first, and a section D for subdividing the resulting band into individual "blister" products to be packed in the containers.

15 Combined with this packing machine 15, or with a "sheathing" machine 16 (Figs. 10 and 11) of the type known under the trade mark ZANASI K 400 which is installed below a packing machine for "blister" products of the IMA C 60 type (not shown in the drawing), an apparatus 17 (Figs. 8 and 9) is provided for operating the feed system for the packing containers 1, 5, 9 stacked in the trays 13 and 14. These trays 13 and 14 are successively fed by a "closed ring" belt conveyor system 18, 19 (Figs. 7 and 11) to a transfer station S from which they pass to a pair of horizontal support rollers 20 (Fig. 9) by means of a pair of "closed ring" moving belts 21 fitted with upstanding thrust elements 22 (Figs. 8 and 9). As the trays are slidably advanced by the thrust elements 22 along the support rollers 20, the notches 4, 8, 12 of the respective containers are engaged by fixed guide rails 23 (Fig. 8). Accordingly, when the trays reach the position corresponding to a station R, a suction arm 24 operated by a hydrodynamic control system removes the trays from the stack of containers and deposits them on conveyor with two parallel conveyor belts 26 of the "closed ring" type, leaving the containers suspended on the fixed guide rails

23. The containers left suspended on the fixed guide rails 23 are then thrust forward by the succeeding trays until they reach a conveyor belt 27 which conveys them into the aforementioned short vertical magazine 28, while the empty 5 trays deposited on the conveyor belts 26 are conveyed to a discharge and collecting station.

CLAIMS

1. A system for feeding packing containers, prefabricated in a flat folded tubular form, to a packing machine, the system comprising means for conveying the flat folded containers in discrete bunches between a pair of elongate, parallel guide members, the containers in each bunch being transversely arranged one behind the other and each having a pair of longitudinally opposed notches for slidably engaging the respective guide members, the notches at least partly defining the end closure members of the container, and the containers in each bunch subsequently being slidably advanced along the guide members toward a storage magazine in response to the next succeeding bunch being conveyed between the guide members.
2. A system according to claim 1 in which the conveying means comprises a plurality of trays for retaining the respective bunches, and means for sequentially advancing the trays between the guide members, each tray having lateral retaining walls of such a height that the said pair of notches are left exposed.
3. A system according to claim 2 further comprising means for lowering the trays one by one after the containers have slidably engaged the guide members whereby the containers remain slidably suspended from the guide members while the empty trays are conveyed to a discharge and collecting station.
4. A system for feeding packing containers substantially as herein described with reference to the accompanying drawings.
5. A system for feeding packing containers, prefabricated in a flat folded tubular form, to a packing machine, the containers comprising preparatory members defined by

notches and serving to give them the tubular shape in which they are to be packed and to close them at their respective opposite ends characterised by the fact that the said containers, on emerging from the machine by which they are produced in the flat folded tubular form, are positioned transversely and sideways in trays having lateral retaining walls of a height such as to leave exposed at least two longitudinally opposite notches defining the said members, by the fact that the trays thus filled are successively fed one by one to a corresponding short vertical magazine of the packing machine, between fixed guides engaging the said longitudinally opposite notches, while the said trays are lowered one by one to leave the containers slidably suspended on the said fixed guides, to be successively thrust by the successive trays toward and into the aforementioned short vertical magazine, while the trays thus emptied are conveyed to a discharge and collecting position.