

Description

[0001] This invention relates to a method of applying leaflets to a succession of containers moving along a path, through a labelling station. The invention further relates to apparatus for performing such a method.

[0002] Particularly in the pharmaceutical industry, though in many other industries as well, there is a need to supply end users of a product with more information than can conveniently be printed directly on packaging for the product. One way of addressing this problem is to provide a folded leaflet which is inserted together with the product into the packaging but often this is not an entirely satisfactory solution for the pharmaceutical industry. There is a strong preference for the information to be associated with the product in such a way that it cannot be misplaced, at least until the product arrives at the end user. To this end, there have been many proposals for attaching a folded leaflet to the packaging so that the leaflet will remain as a part of the packaging until it is removed, by the intended user.

[0003] A problem associated with the provision of leaflets on the packaging of products is that the leaflet should be readily removable by the end user, but otherwise should be essentially permanently connected to the packaging until the product reaches the end user. Further, the attachment of the leaflet to the packaging does present certain difficulties, often on account of the fact that the leaflet usually is of folded paper and so tends to spring out from its folded state, as the leaflet is handled during the attachment thereof to a package.

[0004] A further problem frequently encountered by the pharmaceutical industry is that there is a need to provide informative labels on packaging for tablets, pills, capsules or the like (all of which are hereinafter referred to for convenience as "tablets") which are manufactured in relatively short runs. Those problems are exacerbated when a product run is destined for different markets, with different labelling requirements. As a consequence, labels must specially be printed for production runs which could be as short as only 50 packets of tablets, though in such a case the variable information could be merely a matter of the language printed on the label.

[0005] The problems are increased when a leaflet is to be associated with a package for tablets produced in very short runs. Stringent quality control measures must be taken to ensure the correct leaflet is associated with the correct tablets and further is printed in the same language as that used on the label. All of these add significantly to the costs of production of short runs of tablets.

[0006] It is a principal aim of the present invention to provide a method of and apparatus for labelling containers in such a way that leaflets may be incorporated in the labelling step, whereby an information leaflet (for example) may be associated with the packaging of the container in an essentially permanent manner, until an end user chooses to remove the leaflet.

[0007] According to one aspect of the present inven-

tion, there is provided a method of applying leaflets to a succession of containers moving along a path through a labelling station and using pre-prepared self-adhesive labels carried on a backing sheet, which method comprises the steps of:

- supplying the backing sheet to a stripping beak so as to strip the labels one at a time from the backing sheet;
- presenting a leading portion of a stripped label to lie in the path of movement of a container;
- moving the container along said path so that the leading portion of the label is picked up by and adheres to a forward part of the container; and
- further moving the container along said path to collect the remainder of the label and adhering said remainder on to the container;

which method is characterised by the further steps of:

- advancing each at least partially-stripped label in turn past a leaflet feeder with the adhesive side of the label facing the feeder;
- operating the leaflet feeder to feed a leaflet on to each label as the label faces the feeder, so that the leaflet adheres to the adhesive side of the label; and
- trapping the leaflet between the label and the container as the container is moved along said path to pick up the leading portion of the label and subsequently to collect the remainder of the label and adhere said remainder to the container.

[0008] According to a second aspect of this invention, there is provided apparatus for applying leaflets to a succession of containers moving along a path through a labelling station and using pre-prepared self-adhesive labels carried on a backing sheet, which apparatus comprises:

- a stripping beak to which the backing sheet carrying the labels is supplied, so as to strip the labels one at a time from the backing sheet and then to present a leading portion of each label to lie in the path of movement of a container;
- means to advance containers along said path so that the leading portion of each label is picked up by and adheres to a forward part of a respective container; and
- means to urge the remainder of a picked-up label into contact with the respective container;

which apparatus is characterised by:

- means to advance each label from the stripping beak to a position adjacent said path, for collection by a container; and
- a leaflet feeder arranged adjacent said means to advance each stripped label such that on operation

of the leaflet feeder the feeder adheres a leaflet to the adhesive side of a label carried by said means to advance each label;

whereby a leaflet is trapped between the label and the container following the adhering of the label to the container.

[0009] With both the method and the apparatus of this invention, a labelling technique using self-adhesive labels is modified so as to permit the affixing of a leaflet to a container such as a packet for tablets, in such a way that the adhesive of the label serves to hold the leaflet as well as to secure the label to the container, trapping the leaflet between the label and the container. The end user may tear the label away so exposing the leaflet but until then, the leaflet is held essentially permanently to the container.

[0010] The method is preferably performed by having the stripping beak closely associated with a magazine for holding a stack of leaflets and to have the magazine disposed closely adjacent the path along which the containers are moved. In this way, the attachment of the leaflet to the label and of the label to the container may be performed essentially in one action, as the label is stripped from its backing sheet, at the stripping beak. Thus, the method is simple to implement even on existing labelling lines and involves no particularly complex apparatus, over and above that ordinarily used for labelling apart from a simple leaflet feeder.

[0011] The magazine preferably has a pusher arrangement which operates in a timed relationship to the advancement of the labels, to push the leaflets out of an end of the magazine and directly on to a part of a label facing said one end following stripping of the label from its backing sheet. A separator arrangement may be provided at the one end of the magazine to prevent a leaflet leaving the one end until a label faces the one end, ready to receive a leaflet. Such a separator arrangement may be in form of a mechanism operated in synchronism with the pusher, or could be a simple static peg, ledge or the like and over which a leaflet is pushed, when it is to be received by a label.

[0012] Typically, the method of this invention may be performed on card packets or cartons containing foil bubble-packed tablets. Such a packet may be significantly longer than it is wide, having regard to the direction of advancement along said path, and be relatively shallow in that it might hold only one or two layers of tablets. The packet would normally have end flaps each having a tab, which flaps are folded up and their tabs inserted into the packet, in effect closing the ends of the packet. A container in the form of such a packet is especially suited to the method of this invention, since the label may also serve as a tamper-proof indicator for the packet, by extending over the folded up end flaps.

[0013] The label may therefore have a width not greater than the width of the packet to be labelled, but may be relatively long so as to be able to overlie one of the

major faces of the packet as well as both end flaps and further to wrap round on to the opposed major face of the packet. In this way, by having the label overlying the regions of the packet where the tabs tuck into the packet and adhering both to a major face of the packet as well as the end flaps, the label may serve to seal the packet and provide tamper-proof evidence of unauthorised opening.

[0014] When being used to label a packet as described above, the length of the label may be sufficient for the label to be advanced on being stripped from the beak so a leading portion of the label lies in the path of advancing movement of a packet, to be picked up by an end face of the packet, while a trailing portion of the label is still held on the backing sheet, awaiting stripping. In such a case, a central portion of the adhesive side of the label faces the end of the magazine containing the leaflets. The leaflet is adhered to the label while stationary in this position and then, on a packet arriving at the labelling station and picking up the leading portion of the label, the stripping operation is recommenced to move the label wholly off the backing sheet, in synchronism with the advancing movement of the packet. Continued packet movement allows the remainder of the label to be applied to the major face of the packet, with the leaflet trapped between the label and the packet.

[0015] As a label leaves the stripping beak, to be applied to a packet as described above, the next following label to be stripped may be advanced and then stopped ready to receive a leaflet and also to be picked up by the next packet, in the same manner as has been described.

[0016] Advantageously, the leading portion of the label is sufficiently long so that the forward edge region thereof may wrap round on to the major face of the packet opposed to the major face which receives the greater part of the label as well as the leaflet. Provided the packet is supplied in the correct orientation, and with the tab of the forward end flap tucking into the packet adjacent said opposed major face, the label will serve to seal that end flap and give the required tamper-proof indication.

[0017] For many packets manufactured as described above, each major face carries one end flap, so that the two end flaps are arranged in the opposite sense, at the two ends of the packet. For the method just described, the part of the label which is adhered to the trailing end face of the packet need not wrap round on to the opposed major face, since the part of the end flap requiring sealing is tucked into the packet adjacent the major face which carries the leaflet.

[0018] Conveniently, lines of weakness are provided on the labels to permit the tearing thereof in the vicinity of a carried leaflet, when applied to a container. Such lines of weakness may be one or more perforations provided on each label and along which the label may be torn so as to free the leaflet from between the label and the container.

[0019] The labelling method described above may ad-

vantageously incorporate an in-line printing step, using a printing head disposed upstream of the stripping beak, in a manner known per se. In such a way, labels may be printed in-line with variable product specific information immediately before the labels are supplied to the stripping beak, for subsequent application to a container. Such printing may be in addition to non-variable information, which may be printed in the conventional way, during a label conversion process. Such in-line printing facilitates the manufacture of relatively short runs of products, aimed at particular markets, and so is particularly suited to the pharmaceutical industry. It is relatively easy to load the leaflet magazine with known numbers of leaflets having particular wording to suit the intended marketplace and label printed in-line.

[0020] By way of example only, one specific embodiment of labelling method and of apparatus for performing the method will now be described in detail, reference being made to the accompanying drawings, in which:-

Figure 1 diagrammatically shows the embodiment of labelling apparatus adapted and configured for labelling packets and also securing a leaflet to the packet, at a first stage of the method; and

Figures 2 to 6 show the subsequent steps of the labelling method performed with the apparatus.

[0021] The method described in the following is intended for performance on containers in the form of a folded card packet (or carton) of generally rectangular cross-sectional and elevational shape. Such a packet 10 has upper and lower major faces 11 and 12 as well as end flaps 13 and 14, each of which has a respective tab 15, 16 tucked into the folded packet to close the ends thereof. The major faces 11 and 12 are formed integrally with side walls (not shown) such that the packet has a tubular form of rectangular cross-sectional shape, suitable for receiving a product such as tablets in foil bubble-pack strips.

[0022] The packets 10 are advanced in the direction of arrow A along a path by a suitable form of conveyor (not shown), through the labelling station diagrammatically shown in the drawings. At this station, there is provided a stripping beak 19 of a known design and adapted to strip, one at a time, a series of self-adhesive, pre-printed labels 20 from a backing sheet 21. To achieve this, the backing sheet is advanced in the direction of arrows B around the nose 23 of the stripping beak 19, the labels peeling away from the nose 23 so as to be projected forwardly from the beak.

[0023] Figure 1 shows an initial step in the method. Here, a label 20 has been advanced from the stripping beak 19 by an extent sufficient to have the leading edge 24 of the label below the path of advancement of packets 10, as those packets are moved by the conveyor.

[0024] Immediately below the beak 19 is a magazine 25 holding a stack of individual pre-printed and folded leaflets 26. A separator (not shown) is arranged at the

forward end 27 of the magazine 25, to retain the leaflets 26 in the magazine until a sufficient force is applied to the back end of the stack of leaflets, by a pusher (not shown). Facing the forward end 27 of the magazine is a label support 28 having a rounded lower profile 29, the lowest point of which is just above the upper major face 11 of a packet 10 being advanced by the conveyor. Below the path of advancement of the packets is a lower wiper 30, for the leading edge 24 of an advanced label, projecting below that path.

[0025] In Figure 1, the adhesive side 32 of a label is shown presented to the forward end 27 of the magazine 25, and a packet 10 is approaching the portion 33 of the label projecting beyond the magazine 25, into the path of advancement of the packet. The pusher mechanism associated with the magazine 25 is operated to move the leaflet 26 exposed at the end 27 of the magazine into engagement with the adhesive side 32 of the label, so that the leaflet sticks to the label, as shown in Figure 2. The label support 28 serves to support the label during this action.

[0026] Figure 3 shows the end flap 13 of the advancing packet 10 coming into contact with portion 33 of the label. As contact is achieved, the label adheres to the end flap 13 and continued movement of the packet draws the label downwardly past the magazine 25, pulling with it the leaflet 26 adhered thereto (Figure 4). The backing sheet 21 is advanced in synchronism with this, to assist the stripping of the remainder of the label still adhered to the backing sheet, and to advance the next label 35 towards the nose 23 of the stripping beak. Simultaneously with this, the lower wiper 30 serves to wrap the leading edge 24 of the label round the junction between end flap 13 and the lower major face 12 of the packet so sealing the forward end flap 13.

[0027] Continued advancement of the packet 10 has the lower profile 29 of the label support 28 wipe the label on to the upper major face 11 of the packet, trapping the leaflet between the label and that upper major face. Eventually, the position is reached as shown in Figure 5, where the packet 10 has passed the label support 28 and as shown, the trailing edge 36 of the label projects beyond the end of the packet.

[0028] The labelling is completed by means of a roller 37 which is lowered in synchronism with the movement of the packet 10, to wipe the label trailing edge 36 down over the rear end flap 14 of the packet. As the tab 16 of that end flap is disposed adjacent the upper major face 11 of the packet, there is sufficient sealing of this end flap 14, and so no need for the label to wrap round on to the lower major face 12, unlike the leading edge of the label. Completion of the labelling in this way is performed concurrently with the advancement of the next label 35 from the backing sheet until that label also reaches the position shown in Figure 6, corresponding to that of Figure 1, ready for another cycle of operation on the next packet 38 being advanced along the path.

Claims

1. A method of applying leaflets (26) to a succession of containers (10) moving along a path through a labelling station and using pre-prepared self-adhesive labels (20) carried on a backing sheet (21), which method comprises the steps of:

- supplying the backing sheet (21) to a stripping beak (19) so as to strip the labels (20) one at a time from the backing sheet;
- presenting a leading portion (24) of a stripped label (20) to lie in the path of movement of a container (10);
- moving the container (10) along said path so that the leading portion (24) of the label is picked up by and adheres to a forward part of the container; and
- further moving the container (10) along said path to collect the remainder of the label (20) and adhering said remainder on to the container;

which method is **characterised by** the further steps of:

- advancing each at least partially-stripped label (20) in turn past a leaflet feeder (25) with the adhesive side (32) of the label facing the feeder;
- operating the leaflet feeder (25) to feed a leaflet (26) on to each label (20) as the label faces the feeder, so that the leaflet adheres to the adhesive side of the label; and
- trapping the leaflet (26) between the label (20) and the container (10) as the container is moved along said path to pick up the leading portion of the label and subsequently to collect the remainder of the label and adhere said remainder to the container.

2. A method as claimed in claim 1, wherein the leaflet feeder comprises a magazine (25) for holding a stack of leaflets (26) and a pusher arrangement which operates in a timed relationship to the advancement of the labels (20), to push the leaflets one at a time out of an end of the magazine.

3. A method as claimed in claim 2, wherein the stripping beak (19) is juxtaposed to the end of the magazine (25), and the labels (20) are directly fed past the end of the magazine with the adhesive side facing the magazine, as the labels are stripped from the backing sheet (21).

4. A method as claimed in claim 3, wherein the magazine (25) is juxtaposed to the path of advancement of the containers (10) and the feeding of a label (20)

to face the feeder presents the leading portion (24) of a label to a forward part (27) of a container so that the label can be collected on advancement of the container.

5. A method as claimed in any of the preceding claims and in which each container (10) is in the form of a cuboid, wherein a first face (13) of the container picks up the label (20) and on further advancing movement of the container along the path, the label is wiped over a second face (11) of the container at right angles to said first face, trapping the leaflet (26) between the label and the second face.

6. A method as claimed in claim 5, wherein a trailing portion (36) of the label (20) is wrapped over a third face (14) of the container (10), parallel to said first face (13).

7. A method as claimed in claim 5 or claim 6, wherein the front edge of the leading portion (24) of the label (20) is wrapped round the first face (13) of the container (10) to lie against a fourth face (12) of the container parallel to the second face thereof.

8. A method as claimed in any of the preceding claims, wherein lines of weakness are provided on the labels (20) to permit tearing of the label in the vicinity of a carried leaflet (26), thereby to permit release of a carried leaflet from a container (10) to which the label has been applied.

9. A method as claimed in any of the preceding claims, wherein each label (20) is printed in line while still carried by the backing sheet (21), with product-specific information relevant to the product to be labelled.

10. Apparatus for applying leaflets (26) to a succession of containers (10) moving along a path through a labelling station and using pre-prepared self-adhesive labels (20) carried on a backing sheet (21), which apparatus comprises:

- a stripping beak (19) to which the backing sheet (21) carrying the labels (20) is supplied, so as to strip the labels one at a time from the backing sheet and then to present a leading portion (24) of each label to lie in the path of movement of a container (10);
- means to advance containers (10) along said path so that the leading portion (24) of each label (20) is picked up by and adheres to a forward part (27) of a respective container (10); and
- means to urge the remainder of a picked-up label (20) into contact with the respective container (10);

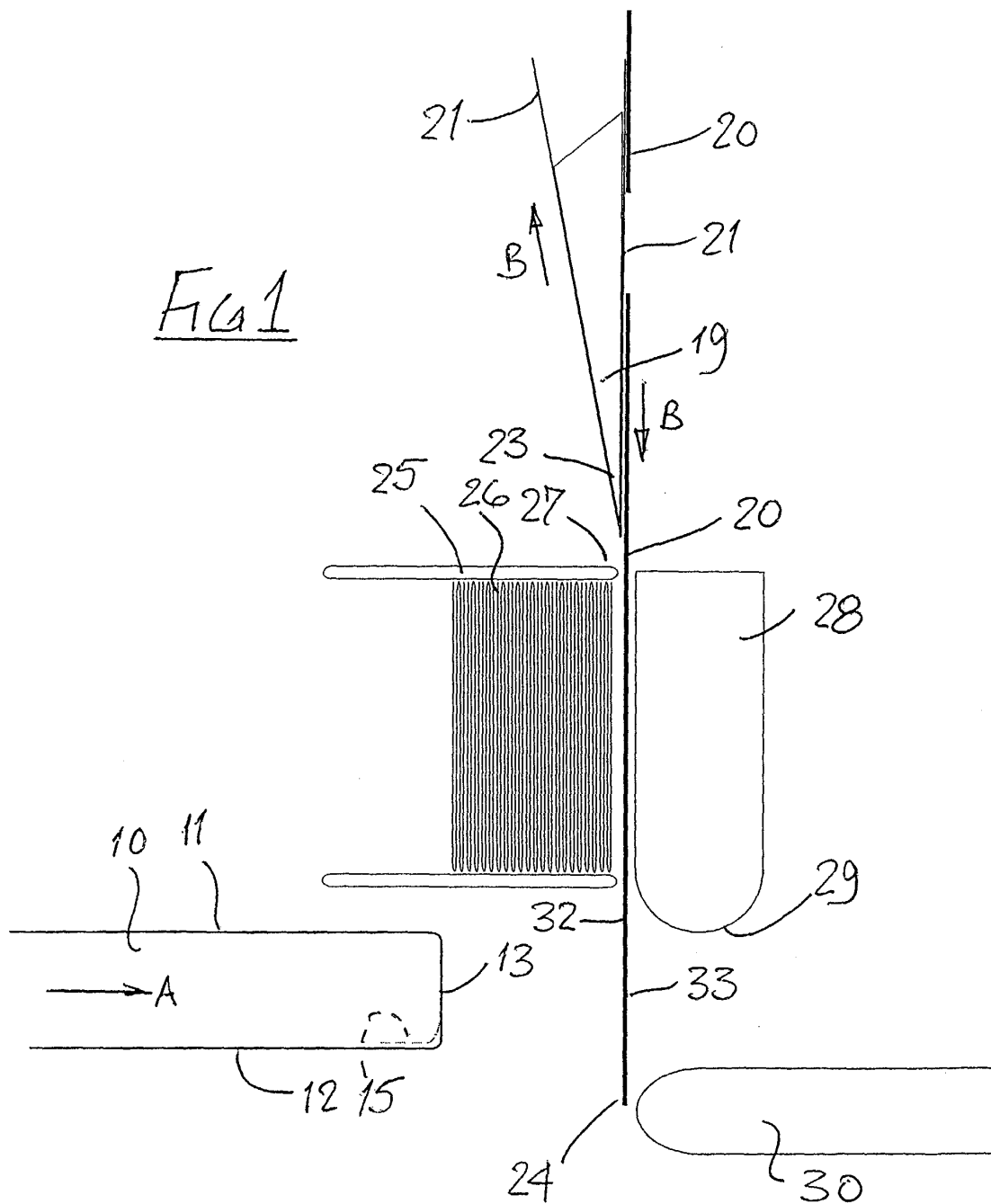
which apparatus is **characterised by**:

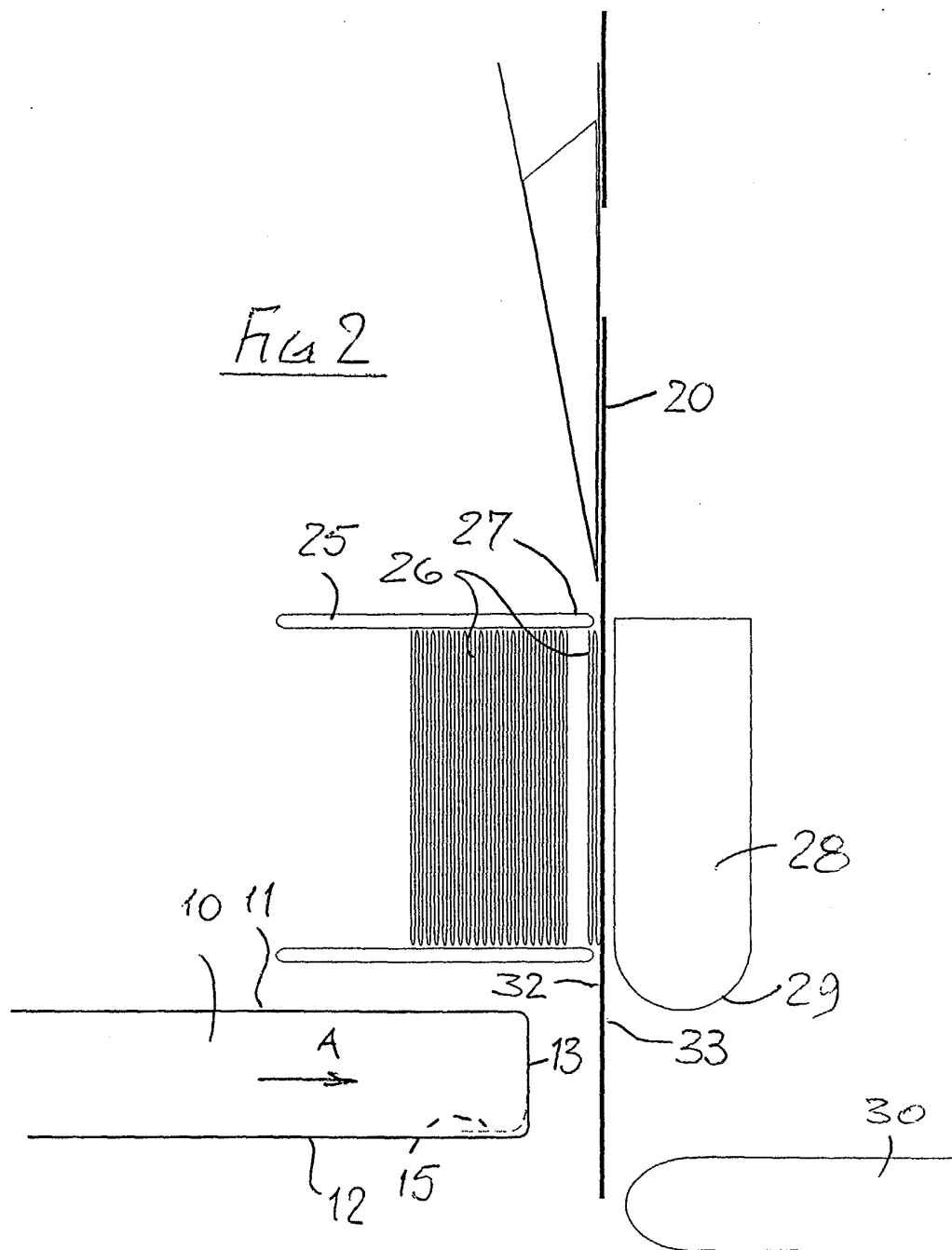
- means to advance each label (20) from the stripping beak (19) to a position adjacent said path, for collection by a container (10); and 5
- a leaflet feeder (25) arranged adjacent said means to advance each stripped label (20) such that on operation of the leaflet feeder the feeder adheres a leaflet (26) to the adhesive side of a label carried by said means to advance 10 each label;

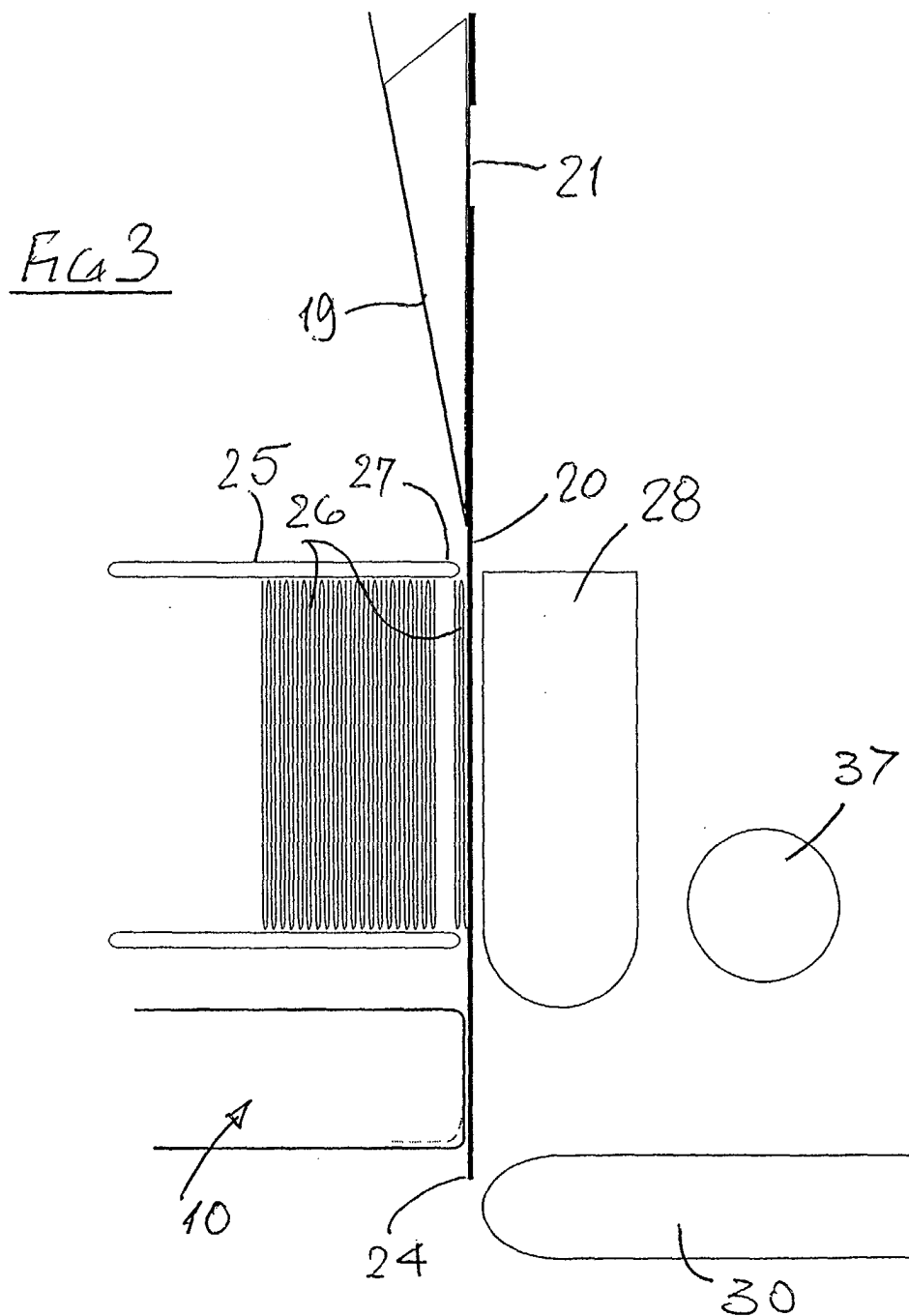
whereby a leaflet (26) is trapped between the label (20) and the container (10) following the adhering of the label to the container. 15

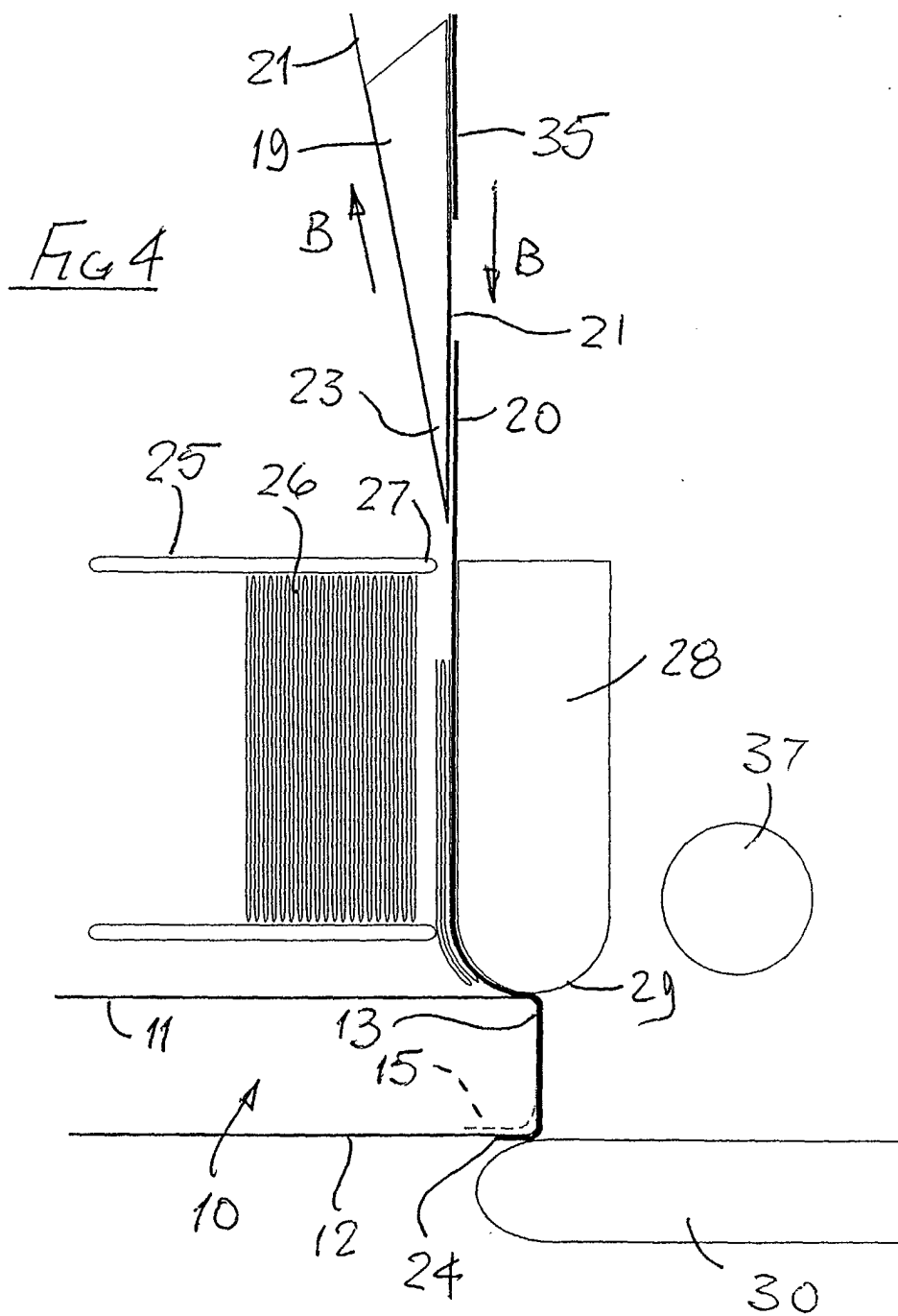
11. Apparatus as claimed in claim 10, wherein the leaflet feeder comprises a magazine (25) for holding a stack of leaflets (26) and a pusher arrangement adapted to operate in a timed relationship to the advancement of the labels (20), to push the leaflets one at a time out of an end (27) of the magazine on to the adhesive side (32) of a label. 20
12. Apparatus as claimed in claim 11, wherein the stripping beak (19) is juxtaposed to said end (27) of the magazine (25), and on being stripped from the backing sheet (21) the labels (20) are directly fed past said end of the magazine to receive a leaflet (26) on the self-adhesive side thereof. 25 30
13. Apparatus as claimed in claim 12, wherein there is provided a label support (28) facing the one end (27) of the magazine (25) and against which the label (20) bears as a leaflet (26) exits the one end of the magazine to adhere to a label. 35
14. Apparatus as claimed in claim 13, wherein a part (29) of the label support (28) is disposed adjacent the path along which containers (10) are advanced and serves to wipe a label (20) on to a container. 40
15. Apparatus as claimed in any of claims 10 to 14, wherein wiping means are provided to wipe a trailing portion (36) of a label (20) on to a container (10) as the container moves away from the labelling station. 45
16. Apparatus as claimed in any of claims 10 to 15 in combination with an in-line printer adapted to print product-specific information on to each label (20) being advanced to the labelling station, before the label is stripped from the backing sheet (21). 50

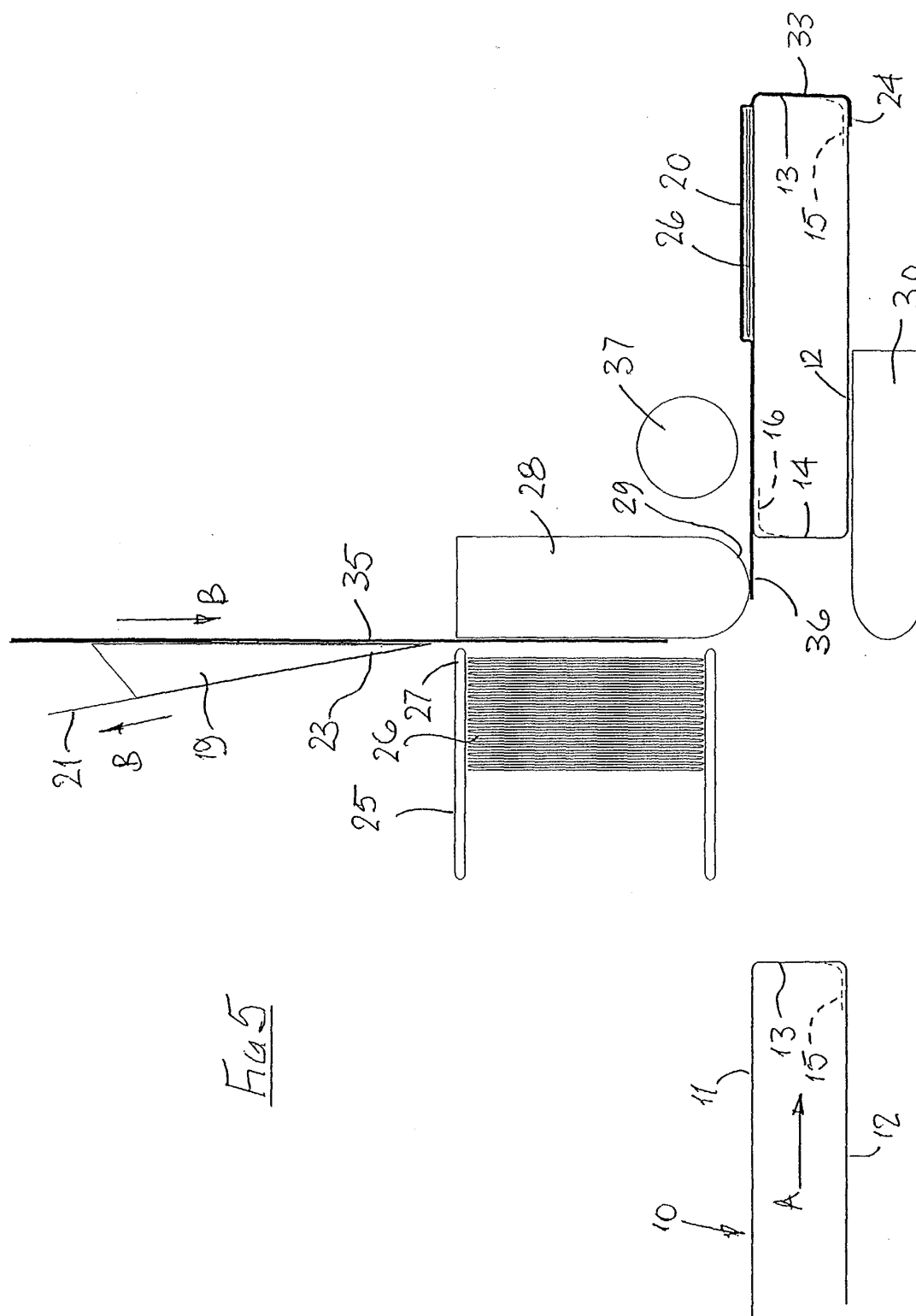
55

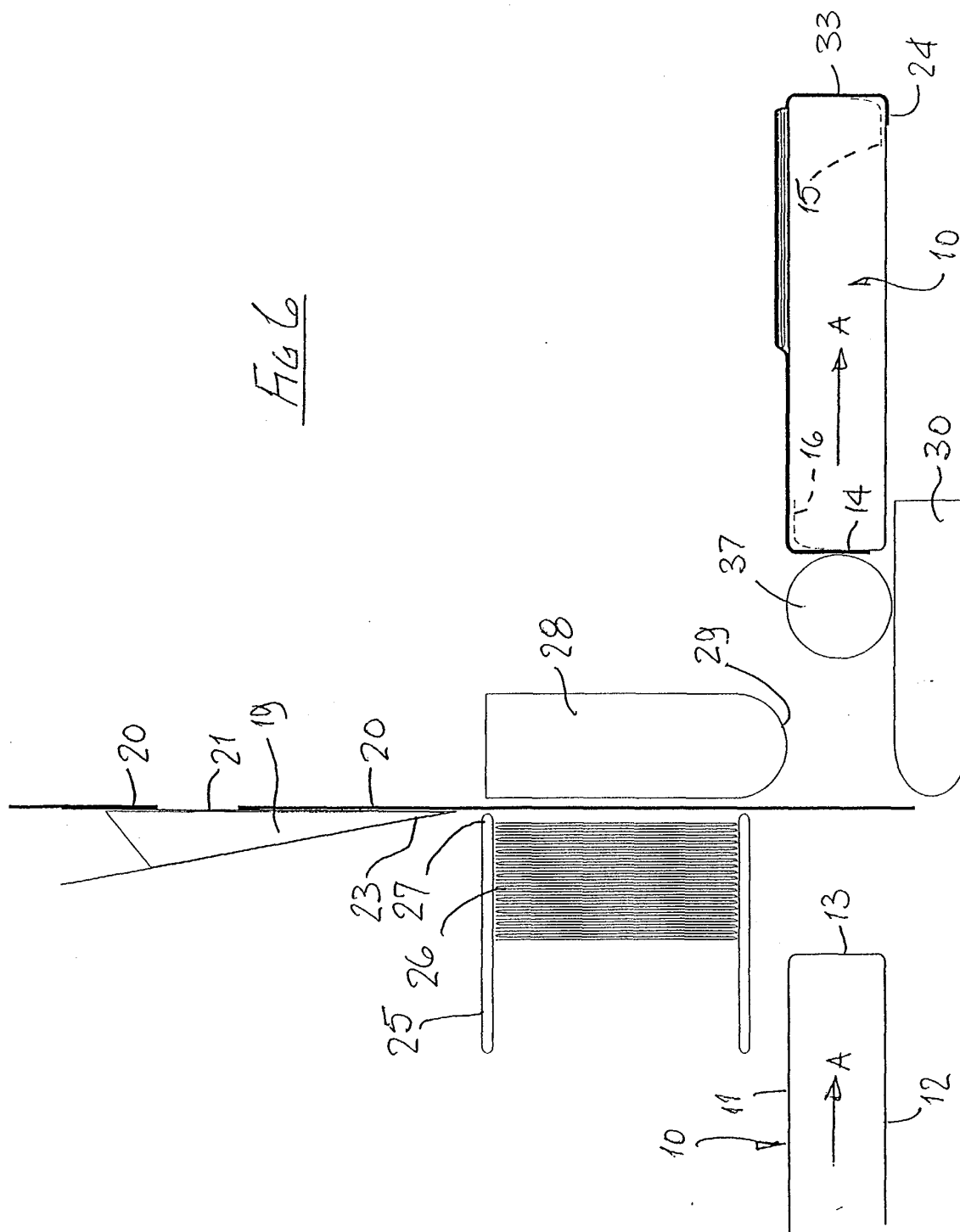














European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 07 7719

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	WO 94 15840 A (PAGO LTD ;COOPER MICHAEL JOHN (GB); ROMAN PETER (GB)) 21 July 1994 (1994-07-21) * page 6, line 8 - page 7, line 5 * * page 7, line 35 - page 9, line 17; figures 1,2,9 * ---	1,10	B65B61/20 B65C9/18
A	WO 97 25247 A (HERMANN WERNER ;LORENTZ MAX (FR)) 17 July 1997 (1997-07-17) * page 7 - page 8; figure 1 * ---	1-5, 10-12	
A	US 4 605 459 A (VOLTMER HELMUT ET AL) 12 August 1986 (1986-08-12) * abstract; figure 1 * -----	1,10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65B B65C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		9 December 2003	Grentzius, W
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (p04C01)

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

EP 03 07 7719

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

09-12-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9415840	A	21-07-1994	AT 153619 T	15-06-1997
			AU 5713594 A	15-08-1994
			DE 69403437 D1	03-07-1997
			DE 69403437 T3	13-06-2001
			EP 0677013 A1	18-10-1995
			WO 9415840 A1	21-07-1994
			JP 8505111 T	04-06-1996
WO 9725247	A	17-07-1997	AU 1365397 A	01-08-1997
			CA 2241847 A1	17-07-1997
			WO 9725247 A1	17-07-1997
			DE 19681220 D2	11-03-1999
			EP 0874756 A1	04-11-1998
			JP 2000504294 T	11-04-2000
US 4605459	A	12-08-1986	NONE	