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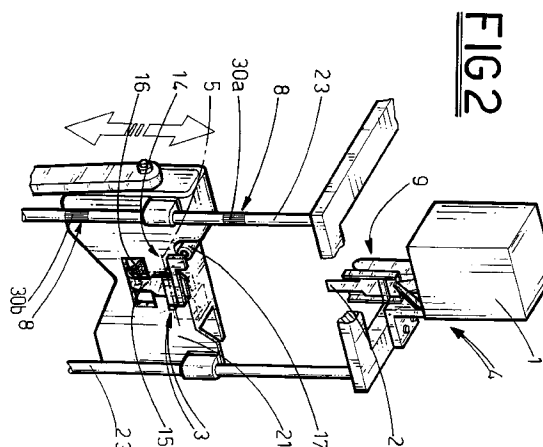
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(54) **A labeling device for automatic net-packing machines.**

(57) The invention related to a labeling device for automatic net-packing machines comprising a net-packing station (27) for each container (7), supported by a car (18), on which car (18) a clipping and cutting group is fixed. The labeling device (4) is of a type equipped with a synchronising apparatus (8) for synchronising the labeling device (4) with the clipping and cutting group (6) and comprising at least one printing and feeding machine (1), and further comprises a mobile gripping mechanism (3) to grip at least one label (2) at a time from the printing and feeding machine (1) and take the label (2) to a clipping point, keeping it in a same position during transport.



The invention related to a labeling device for automatic net-packing machines.

Over a period of years and in various stages, machines for packing containers of fruit and vegetable products have become more and more automatised. In 1983 a completely automatic machine was realised by the present applicant which was able to net-pack the containers of fruit and vegetable products and apply support and labeling strips on them. The machine in question, Italian Patent no. 1,168,656 obtains its aim by placing several stations in a line: in particular, the machine comprises a container feeding station, with the containers transiting inside a net-bearing tube and being brought to a net-packing station for each container, whereat there is also a support-trip-application and labeling station, all operating in phase. In this way, the production rate was considerably increased, and the presence of operators almost completely obviated. In the intervening years various improvements have been made to single stations in the line, with the aim of further improving the machine's performance, improvement which have been protected by various patents.

At present, machines of this kind apply only string-attached labels. To obtain other kinds of label, for example flag-type labels, up until now feeding devices bringing one end of the label directly to the clipping point have been used. Since, obviously, the latter activity cannot be performed at the same time as the clipping, and since between the printing of one label and the next there is a time-lapse which is longer than the machine cycle time, the production rhythm is determined by the printing time of the labels, penalising the packing production speed.

Further, the machines supply the labels from below, where during operation considerable dirt collects, and what is more, the labels end up on the bottom of the container's and are less apparent to consumers.

The aim of the invention is to eliminate the above-mentioned drawbacks. The invention, as it is characterised in the claims that follow, solves the problem by freeing the machine cycle from the label-printing device.

One of the advantages obtained by the present invention consists in the fact that the label feeding and printing machine is removed to a cleaner zone, that is, a higher zone than the main functioning line of the automatic net-packing machine.

A further important advantage is that the pause times of the label printing and feeding machine are drastically reduced, since the time necessary for the printing of one label is also exploited for the application of the preceding label: this leads to a relevant increase in the number of containers produced per time unit.

A further advantage in favour of the present invention is that by positioning the label printer above,

the meaningful part of the label is clearly in view to the consumer.

Further characteristics and advantages of the present invention will better emerge from the detailed description that follows, of a preferred but non-exclusive embodiment here illustrated in the form of a non-limiting example in the accompanying drawings, in which:

- figure 1 shows the machine applying the invention in its entirety in perspective view;
- figure 2 shows the invention in perspective view;
- figures 3, 4 and 5 shows the invention respectively in a frontal view and in two sectioned lateral views of details evidencing some applicational characteristics.

As can be seen in the figures, the invention concerns a labeling device for automatic net-packing machines. The device is particularly suitable for machines of this type comprising a net-packing station 17 of each container 7, supported by a car 18 bearing a clipping and cutting group 6. The labeling device 4 is of the type equipped with a synchronising apparatus 8 with the clipping and cutting group 6 and comprises at least one label printing and feeding machine 1; it also has a mobile gripping mechanism 3 to take at least one label 2 at a time from the said label printing and feeding machine 1 and to transport it to the clipping point, keeping it in the same position during the transport. In this way, the label printing and feeding machine 1 does not have significant dead times, as the time necessary for printing a new label 2 corresponds to that required by the mobile gripping mechanism 3 to transport the preceding label 2 to the clipping point and to return to the label 2 feeding point.

At the feeding moment, the labels 2 are curved as they have been peeled off a roll of like labels 2, so first stabilising means 9 of the label position are provided, synchronised with the movement of the mobile gripping mechanism 3 and aimed at guaranteeing a correct gripping of the label 2 from the said label printing and feeding machine 1.

The clipping phase is also a very delicate moment. Just as in previous machines, the operation takes place on a horizontal plane, and the label 2 must also be absolutely horizontal. Second stabilising means 12 of the label position are provided for this reason, synchronised with the movement of the mobile gripping mechanism 3 and aimed at permitting a closing of the net and at least the application of the label 2 with one single clipping operation.

In the embodiment shown, the first and the second stabilising means 9 and 12 comprise respectively a first blowing element 10 acting on the label 2 during the ascending run of the mobile gripping mechanism 3 so as to predispose the end tract of the label 2 vertically, and a second blowing element 13 solid to the mobile gripping mechanism 3 and acting on the label

2 during the clipping phase so as to keep the end tract of the label 2 in a substantially horizontal lie.

Other embodiments are, however, possible: for example, the first stabilising means 9 might comprise a mechanical guide 11 for the label 2, represented by a broken line in figure 5, synchronised with the mobile gripping mechanism 3 in such a way as to pass from a first advanced position, in which the end tract of the label 2 is kept in a vertical position, up until the interaction of the label 2 with the mobile gripping mechanism 3, to a second, retracted position in order to avoid interference with the mobile gripping mechanism 3, which is rising, and to follow the appearance of the next label 2.

The embodiment described herein relates to the case in which a guillotine 19 is stationed on the car 18, which guillotine 19 comprises a first pair of fixed V-conformed contrast elements 20, arranged transversally to the advancement direction of the containers 7 and distanced parallel to them so as to receive, inferiorly and at the vertex of the V, a clipping and cutting head 6a which is part of the group 6; a second pair of mobile contrast elements 21, conformed in an upturned V shape, and operating in contrast with the first contrast elements 20 but located superiorly to them and on slightly uneven planes with respect to them. The second elements 21 are slidably supported by at least one pair of columns 23, solid to the car 18 and vertically translating in two directions from a first, raised position, wherein the two pairs of elements 20 and 21 create a rhomboidal opening 22 through which the container 7 can transit, to a second, lowered position, in which the two pairs of elements 20 and 21 grip the strip of net which is acted upon by the clipping and cutting head 6a. In this case, the mobile gripping mechanism 3 is solid to the second pair of mobile contrast elements 21, the first stabilising means 9 of the label 2 position being solid to the label printing and feeding machine 1 and the second stabilising means 12 being solid to the same second pair of mobile contrast elements 21. The mobile gripping mechanism 3 comprises:

- pliers 14 constituted by a curved appendix 15 fixed to an element 21a of the second pair of mobile contrast elements 21 and to a contrast element 16 solid to the same element 21a, the appendix 15 being free to rotate with respect to the contrast element 16;
- a pneumatic piston 17 for controlling the movement of the appendix 15 acting at a superior level to the level of the horizontal rotation axis 5 of the appendix 15;
- a recall spring 25 of the curved appendix 15, visible in figure 3, representing a detail in frontal view, aimed at leaving the pliers 14 open when the pneumatic piston 17 is not activated.

The synchronising apparatus 8 to regulate the functioning of the pneumatic piston 17, the label print-

ing and feeding machine 1, the mobile gripping mechanism 3, the clipping and cutting group 6 and the first and second stabilising means 9 and 12, comprises electrical devices 30a and 30b which signal when the lower and upper dead points have been reached in the run of the mobile gripping mechanism 3.

The device functioning can be schematised as follows. During the rising of the second pair of mobile contrast elements 21, to which the mobile gripping mechanism 3 is solid, the pneumatic piston 17 is released, while the first blowing element 10 keeps the label 2 disposed vertically so that it can be correctly met and subsequently gripped between the curved appendix 15 and the contrast element 16. When the second pair of mobile contrast elements 21 reaches the upper dead point a first electrical device 30a is activated, which commands the cutting of the label 2 by the label printing and feeding machine 1, the end of the action of the first blowing element 10 and the contemporaneous beginning of the action of the pneumatic piston 17 which, acting on the curved appendix 15, determines the gripping of the pliers 14, previously open, due to the presence of the recall spring 25 associated to the curved appendix 15 itself. During the lowering, the pneumatic piston 17 continues to act, keeping the pliers closed. Similarly to the above, a second electrical device 30b is activated when the second pair of mobile contrast elements 21 reaches the lower dead point. In sequential order, the following are activated: the second blowing element 13, which keeps the free end of the label 2 horizontal, resisting its tendency to curl back on itself and permitting of realising an optimal clipping, the clipping operation, the deactivating of the second blowing element 13 and the arresting of the pneumatic piston 17 action on the curved appendix 15. Once all this is achieved, a new cycle begins with the rising of the second mobile contrast elements 21.

Claims

1. A labeling device for automatic net-packing machines of the type comprising a net-packing station (27) for each container (7), supported by a car (18), a clipping and cutting group (6) being fixed on the car (18), the labeling device (4) being equipped with a synchronising apparatus (8) to synchronise the labeling device (4) with the clipping and cutting group (6) and said labeling device (4) comprising at least one label printing and feeding machine (1), the labeling device being characterised in that it comprises a mobile gripping mechanism (3) aimed at receiving at least one label (2) from the label printing and feeding machine (1) and transporting it to a clipping point, keeping it in a same position during transport.

2. A labeling device as in claim 1, characterised in that a first stabilising means (9) of a position of the label (2) are provided, synchronised to a movement of the mobile gripping mechanism (3), to allow the mobile gripping mechanism (3) correctly to receive the label (2) from the label printing and feeding machine (1).

3. A labeling device as in claim 1, characterised in that a second stabilising means (12) of the label (2) position are provided, synchronised with a movement of the mobile gripping mechanism (3) and aimed at permitting of closing a net and at least applying the label (2) with a single clipping operation.

4. A labeling device as in claim 1, of a type wherein a guillotine device (19) is also fixed on the said car (18), which guillotine (19) comprises a first pair of fixed V-conformed contrast elements (20), arranged transversally to the advancement direction of the containers (7) and distanced parallel to them so as to receive, inferiorly and at the vertex of the V, a clipping and cutting head (6a) which is part of the group (6); a second pair of mobile contrast elements (21), conformed in an upturned V shape, and operating in contrast with the first contrast elements (20) but located superiorly to them and on slightly uneven planes with respect to them which second elements 21 are slidably supported by at least one pair of columns (23), solid to the car (18) and vertically translating in two directions from a first, raised position, wherein the two pairs of elements (20) and (21) identify a rhomboidal opening (22) in which the container (7) can transit, to a second, lowered position, in which the two pairs of elements (20 and 21) hold back the strip of net acted upon by the clipping and cutting head (6a), the labeling device (4) being characterised in that the mobile gripping mechanism (3) is solid to the second pair of mobile contrast elements (21), a first stabilising means (9) being solid to the label printing and feeding machine (1) and a second stabilising means (12) being solid to the second pair of mobile contrast elements (21), the mobile gripping mechanism (3) comprising:

- pliers (14) constituted by a curved appendix (15) fixed to an element (21a) of the second pair of mobile contrast elements (21) and to a contrast element (16) solid to the same element (21a), the appendix (15) being free to rotate with respect to the contrast element (16);
- a pneumatic piston (17) for controlling movement of the appendix (15) acting at a superior level to a level of a horizontal rotation axis (5) of the appendix (15);

- a recall spring (25) of the curved appendix (15), aimed at leaving the pliers (14) open when the pneumatic piston (17) is not activated.

5. A labeling device as in claim 2, characterised in that the first stabilising means (9) comprise a first blowing element (10), acting on the label (2) during an ascendent run of the mobile gripping mechanism (3), in such a way as to dispose an end tract of the label (2) vertically.

6. A labeling device as in claim 2, characterised in that the first stabilising means (9) comprise a mechanical guide (11) of the label (2), synchronised to the mobile gripping mechanism (3) in such a way as to pass from a first advanced position wherein the mechanical guide 11 keeps the end tract of the label (2) vertical up until an interaction of the end tract with the mobile gripping mechanism (3), to a second retracted position to avoid interference with the mobile gripping mechanism (3) which is rising, and to follow the appearance of a successive label (2).

7. A labeling device as in claim 3, characterised in that the second stabilising means (12) comprise a second blowing element (13), solid to the mobile gripping mechanism (3) and acting on the label (2) during a descendent run of the mobile gripping mechanism (3), in such a way as to keep the end tract of the label (2) in a horizontal position.

8. A labeling device as in claim 4, characterised in that it provides a synchronising apparatus (8) to regulate functioning of the pneumatic piston (17), the label printing and feeding machine (1), the mobile gripping mechanism (3), the clipping and cutting group (6), and the first and second stabilising means (9 and 12).

9. A labeling device as in claim 8, characterised in that the synchronising apparatus (8) comprises a plurality of electronic devices (30) to signal when an upper and a lower dead points have been reached in the mobile gripping mechanism (3) run.

FIG 1

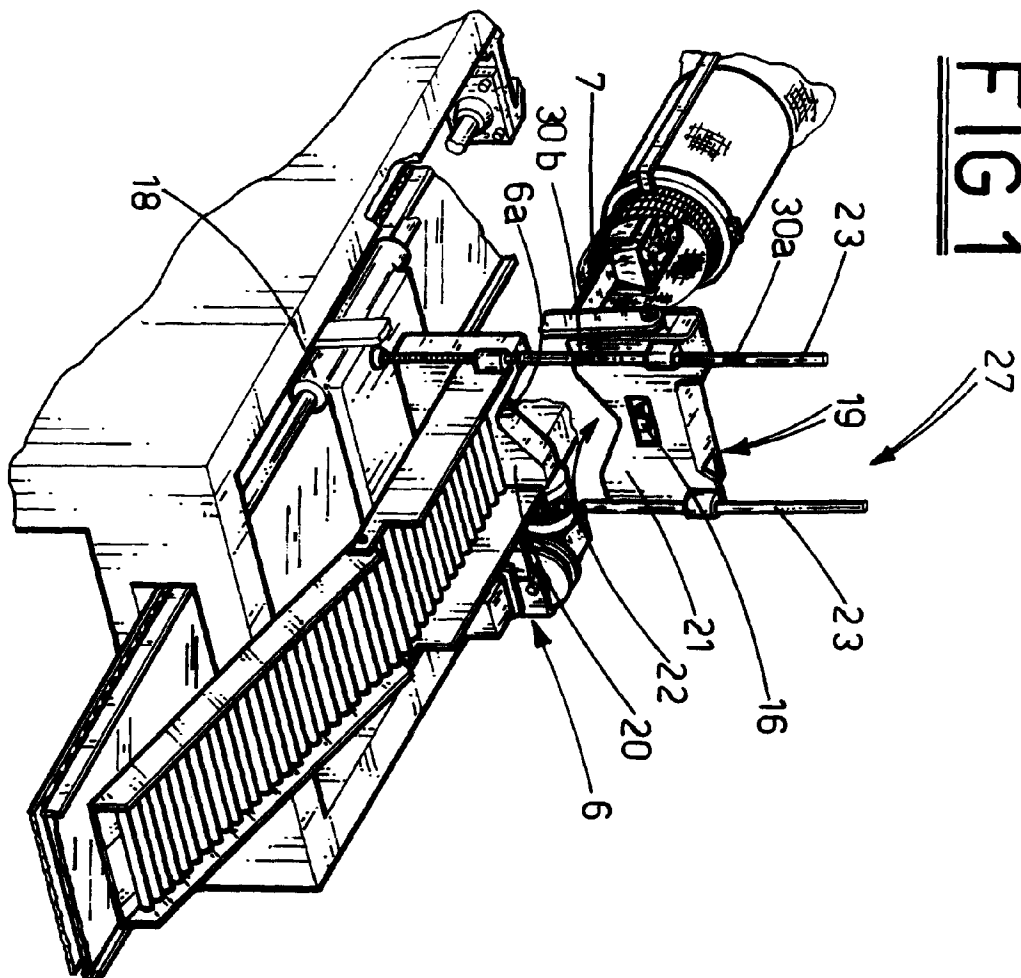


FIG 2

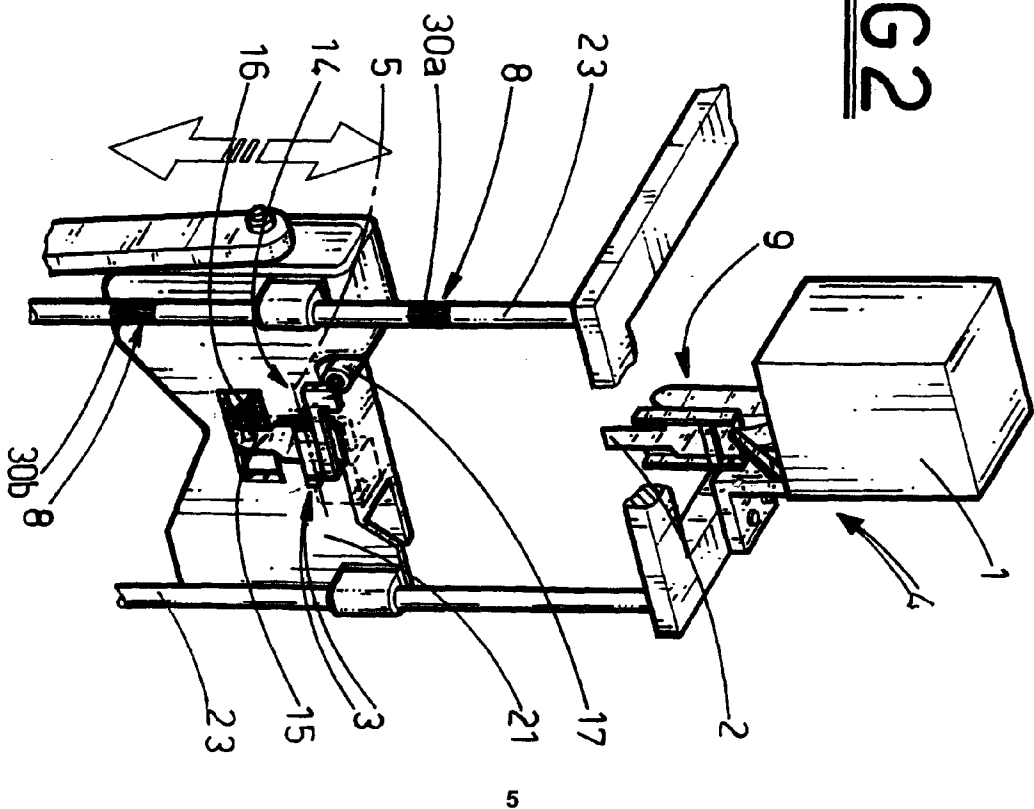


FIG 3

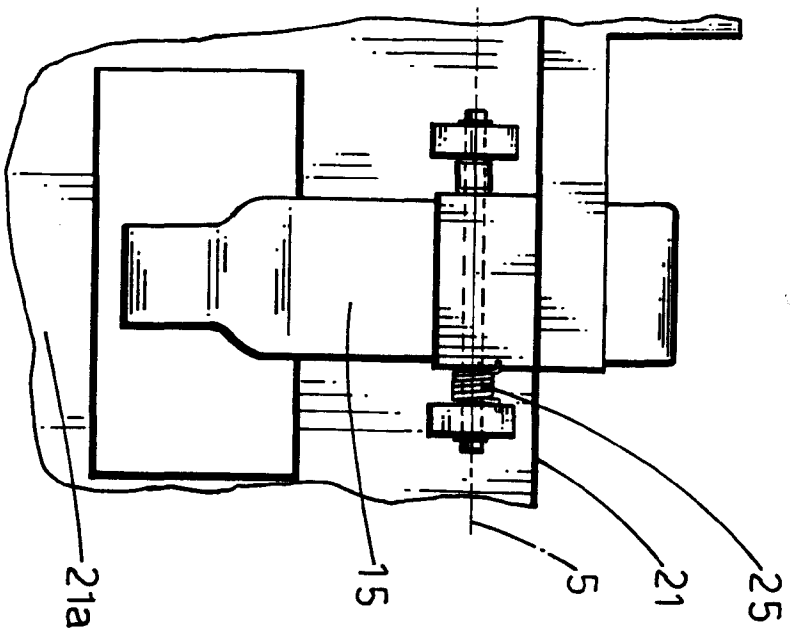


FIG 4

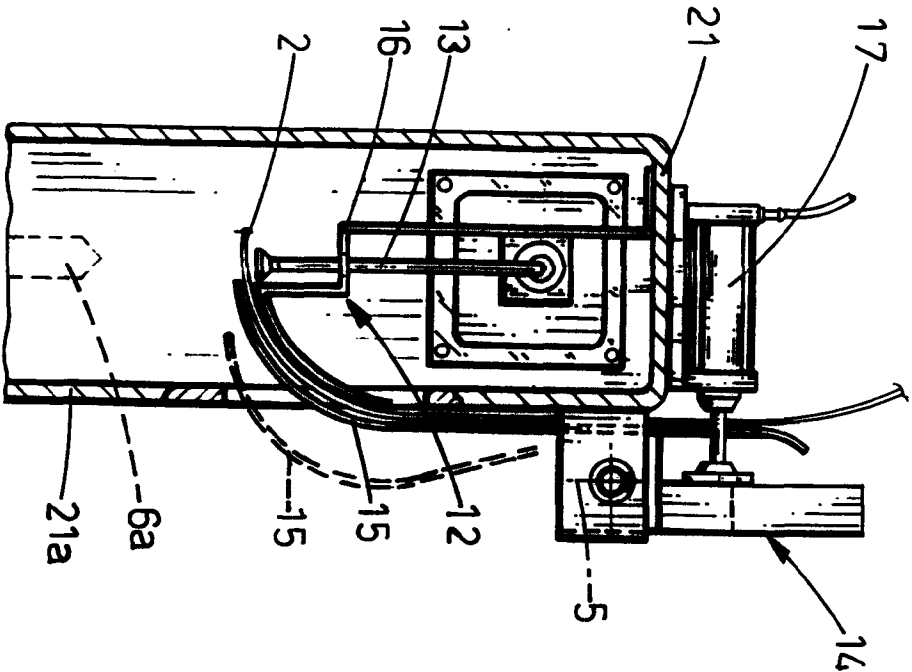
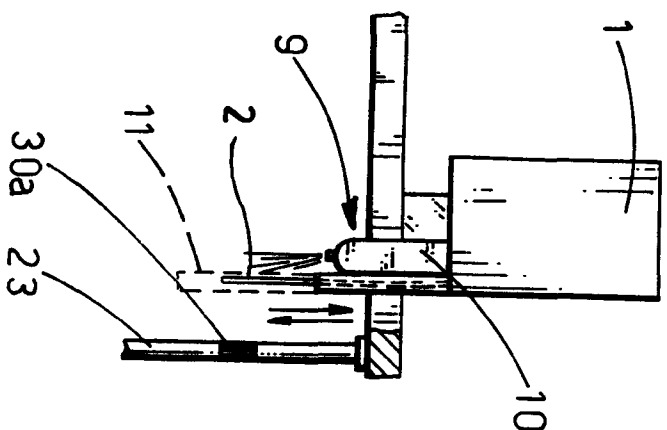


FIG 5





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 93 83 0357

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.5)
X	FR-A-2 248 195 (MITJANS CANALDA ET AL.) * page 11, line 24 - line 32; claim 1; figures *	1	B65C7/00 B65B51/04
D,A	EP-A-0 123 655 (SORMA SRL) & IT-A-1 168 656 (SORMA SRL)		
A	DE-A-24 28 657 (SEIFERT)		
A	GB-A-1 256 177 (BUISE)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			B65C B65B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 December 1993	Examiner Deutsch, J-P
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			

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