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(54) Method and apparatus for packing flower bouquets

(57) The invention provides a method of packing a flower bouquet in a conical cover made of material (S). In this method at least one discrete sheet (S) of material is provided and a flower bouquet (B) is brought substantially in register with the sheet. The sheet is picked up and folded around the flower bouquet, bringing together two opposed sheet edges so as to form a conical cover. The sheet edges are interconnected to form the conical

cover.

The apparatus to perform this method comprises a support (2) for supporting the sheets (S), grippers (8) for gripping two opposite edges of the sheet, two chain conveyors (7) to bring the grippers from a position adjacent the edges of a flat sheet to a position adjacent to each other, and connecting means (12) for interconnecting the opposite edges of the sheet.

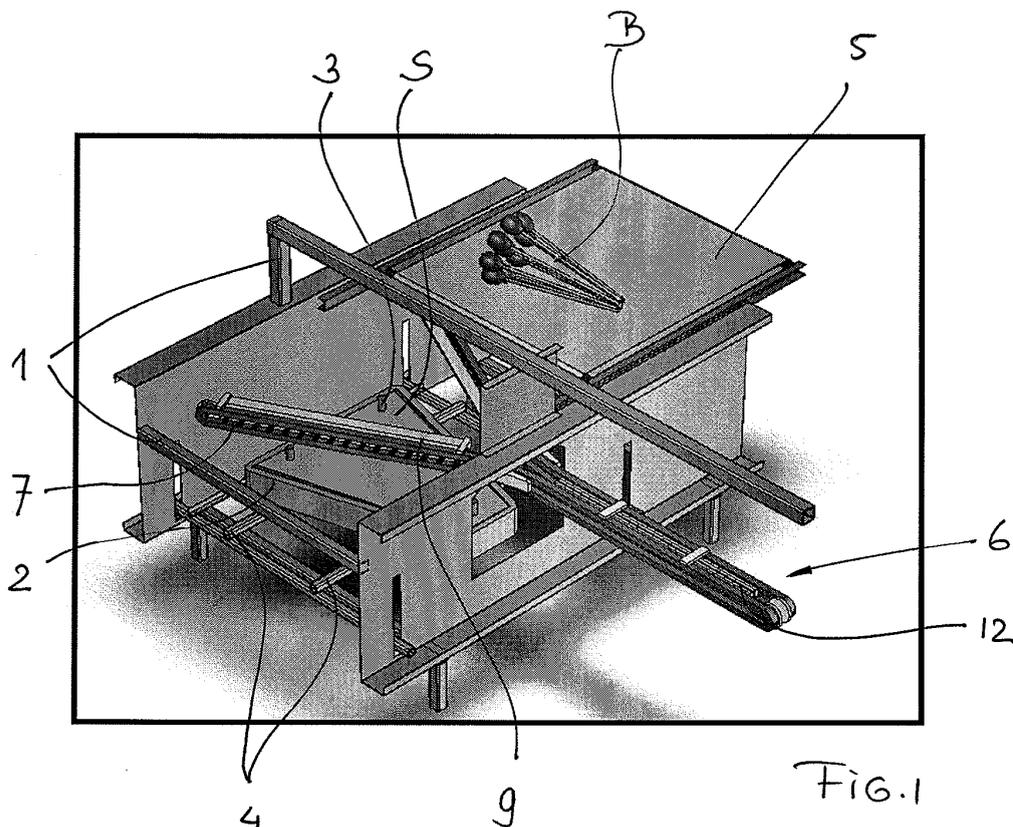


Fig. 1

Description

[0001] The present invention relates to a method of packing a flower bouquet in a conical cover made of plastic or paper foil material. The invention also relates to an apparatus for carrying out such method.

[0002] In the prior art, many methods and apparatus have been devised in order to automate the packing or wrapping of flower bouquets in a cover. In most of the methods, one starts from a preformed sleeve or wrapping. In order to introduce the flower bouquet into the sleeve, it is necessary to open a mouth of the sleeve and to move a flower bouquet and sleeve with respect to each other. The flower bouquet is then introduced into the opened sleeve. Examples of such methods and apparatus are disclosed for example in GB 2 400 835 A, EP 1 266 831 A2 and NL 1020379 C. A problem with such method and apparatus is that it is very difficult to reliably open the sleeve on the one hand and to introduce the flower bouquet into the opened sleeve on the other hand.

[0003] Another method is one in which sheet material is supplied from one or two rolls of material and is wrapped around the flower bouquet and cut from the sheet roll. The apparatus to perform such methods are quite complex the examples thereof are disclosed in NL 101879 C, NL 006023C and GB 2 214 481 A.

[0004] It is an object of the present invention to provide an improved method and apparatus for packing a flower bouquet.

[0005] To obtain this object, the method according to the invention comprises the steps of:

providing at least one discrete sheet of material, bringing a flower bouquet substantially in register with the sheet,
picking up the sheet and folding it around the flower bouquet, bringing together two opposed sheet edges so as to form a conical cover,
interconnecting the sheet edges to form the conical cover.

[0006] According to the invention, one starts from discrete sheets of foil material which are wrapped and closed. This leads to a relatively simple and reliable method of packing flower bouquets.

[0007] Preferably, sheets are supplied as a stack of preformed sheets, which is the most efficient way of supplying the sheets.

[0008] A simple manner of bringing of flower bouquet and the sheet together is to drop the flower bouquet onto the sheet which is to be folded around it. In this way the flower bouquet will be picked up as well as the sheet if picked up in order to be folded around the flower bouquet.

[0009] In a preferred embodiment according to the invention, the sheet is gripped at its edges to be interconnected, and the edges are brought together, preferably by moving the sheet edges along converging paths such that the edges are brought together, preferably in an over-

lapped relationship, and sealed, preferably heat-sealed in case the cover is made of plastic material.

[0010] In this manner there is provided a simple way to move the sheet edges toward each other in order to be interconnected.

[0011] The apparatus for packing a flower bouquet according to the invention is characterised by:

a support for supporting at least a sheet material, gripping means for gripping two opposite edges of the sheet,
conveying means to bring the gripping means from a position adjacent the edges of a flat sheet to a position adjacent to each other, and
connection means for interconnecting the opposite edges of the sheet.

[0012] The invention also includes a stack of cover sheets to be used in a method of packing the flower bouquet. Said stack includes a plurality of loose singular sheets having a substantially trapezoidal shape such that the sheets can be formed into a conical cover by connecting two similar edges.

[0013] Such stack of cover sheets forms a convenient supply of sheets which should be wrapped around flower bouquets to form a cover or sleeve around a flower bouquet.

[0014] The invention will now be explained in further detail with reference to the accompanying drawings, in which:

Figs. 1-4 are very schematic perspective views of an embodiment of the apparatus according to the invention in four different stages of packing a flower bouquet.

Figs. 5-7 are very schematic perspective views of a part of the apparatus of Figs. 1-4 and a sheet handled by these parts in three different stages.

Fig. 8 is a very schematic sectional view along the line VIII-VIII in Fig. 3, on a larger scale.

[0015] Figs. 1-4 show an embodiment of an apparatus for packing flower bouquets in covers, which comprises a frame 1. Connected to this frame 1 is support 2 for supporting a stack of sheets S lying in a flat position onto each other. Each of these sheets S is made of plastic foil material and is used to form a conical cover or sleeve for a flower bouquet B. To this end, each single sheet S has a substantially trapezoidal shape and in the embodiment shown, the sheet S has two inclined sides and two parallel sides, a long one and a short one. The shape of the sheets S may be different. For example, the long and short sides may be curved, for example as a segment or a circle, but it is also conceivable that the long side has an ornamental shape. In the embodiment shown, the sheets S have four holes in order to co-operate with positioning pins 3 provided on the support 2 and adapted to fit into the holes in the sheets S. In this manner, the stack of sheets S is

accurately positioned on the support 2.

[0016] As is shown in Fig. 8, the support 2 comprises spring means 2a acting onto the stack of sheets S from below, as well as stop edges 2b to engage the inclined edges of the sheets S. This spring means 2a and stop edges 2b ensure that the upper sheet S of the stack is always kept at the same level with respect to this support 2. This is a common way of supporting a stack of sheet products.

[0017] The support 2 is suspended in the frame 1 by means of a lift 4. The lift 4 can move the support 2 between a lower, inactive position (Fig. 1) and a higher active position (Fig. 2).

[0018] The apparatus further comprises means for supplying the flower bouquets B, here in the form of a conveyor 5, in particular a belt conveyor supported by the frame 1. This conveyor 5 may be connected to a conveyor from another apparatus, for example an apparatus for forming flower bouquets B. The discharge end of the conveyor 5 is positioned above the support 2, such that the flower bouquets B will be dropped from the discharge end of the conveyor 5 onto the upper sheet S of the stack of sheets on the support 2 substantially in a central position thereof. Positioning means may be provided to assist in positioning the flower bouquets B.

[0019] The apparatus comprising further conveying means 6 which are intended to convey one of the sheets S and a flower bouquet B positioned thereon from the support 2 to a position where a sleeve is formed from the sheet S. This conveying means 6 comprises two conveyor members, here in a form of chain conveyors 7 each including an endless (side-bow) chain. This chain conveyors 7 follow a conveying path having two different parts: a first part in which the chain conveyors 7 are inclined with respect to each other and converge in their direction of conveyance and a second part in which the chain conveyors 7 extend substantially parallel and adjacent to each other.

[0020] Attached to the chain links of the chain conveyors 7 are gripping means, here in a form of separate grippers 8. These grippers 8 may take the form of a pair of jaws, a fixed jaw attached to or forming part of the chain links and a moveable jaw. This moveable jaw may be spring loaded to the closed gripping position and the apparatus may be provided with an operating member 9 which is able to move the moveable jaws of the grippers 8 to an open position to take up the respective edge of the sheet S. The operating members 9 may be configured for example as a moveable strip positioned alongside the first part of the chain conveyors 7.

[0021] The apparatus is also provided with vacuum means 10 (Fig. 8) which are also provided alongside the first part of the chain conveyors 7 and which are adapted to lift the respective side edges of the upper sheet S of the stack and to move this sheet edges into the opened jaws of the grippers 8. The vacuum means 10 may take the form of vacuum beams, having communication channels and openings 11 which communicate with a vacuum

source. The vacuum beams may be positioned inwardly of the chain conveyors 7 and grippers 8 and may be configured such that the respective side edges of the upper sheet S will be lifted in an upwardly and outwardly inclined position into the grippers 8, as is shown in Fig. 8.

[0022] The apparatus is further provided with connection means 12 for interconnecting the opposite edges of each sheet S with the flower bouquet B provided therein. This connection means 12 is positioned in the second part of the conveying path of the chain conveyors 7 where the chain conveyors 7 run parallel and adjacent to each other. These connection means 12 is preferably a heat-sealing device adapted to heat-seal the adjacent or overlapping edges of each sheet S. Several embodiments are conceivable. For example, heat-sealing beams may be positioned below the chain conveyors, such that the edges of the sheet S will be sealed together at the position below the chain conveyors 7 and then cut off at the convenient position. It is also possible that the grippers are operated after the heat-sealing step to release the sheet S from the chain conveyors 7. Other embodiments are conceivable.

[0023] Figs. 1 - 4 and 5 - 7 show various stages of the method of forming a cover or sleeve around a flower bouquet B.

[0024] In Fig. 1 a flower bouquet B is being supplied on the conveyor 5. The support 2 is in its lower position and the chain conveyors 7 are at rest.

[0025] In Fig. 2, the support 2 has been moved into an upper position, ready to receive the flower bouquet B from the conveyor 5.

[0026] In Fig. 3, the flower bouquet B has been dropped from the conveyor 5 onto the upper sheet S of the stack on the support 2. Positioning means may ensure that the flower bouquet B is positioned correctly, i.e. centrally both in longitudinal and transverse directions.

[0027] In this position, the vacuum means 10 are activated, such that the edges of the upper sheet S are sucked against the beams of the vacuum means 10. The freed edges of the upper sheet S are introduced into the grippers 8 which have been opened by the operating member 9. The operating member 9 is then deactivated so that the movable jaws 8b of the grippers 8 move to the closed position in which the edges of the sheet S are pinched between the jaws 8A and 8B of the grippers 8. The support 2 is then lowered so that the upper sheet S is at a distance above the support 2 and the remaining sheets stacked thereon.

[0028] In this position, as is indicated in Fig. 5, the chained conveyors 7 will be activated and will start to move with the conveying parts thereof in a direction away from the support 2. As the first parts of the chain conveyors 7 converge, the edges of the gripped sheet S will be moved toward each other during transport by the chain conveyors 7. As a result, the sheet S will be formed as a conical sleeve which closes above the flower bouquet B which is hanging in the sheet S which is suspended from the chain conveyors 7 of the conveying means 6.

As the sheet S has arrived completely in the second part of the conveying path of the chain conveyors 7, the chain conveyors 7 will be stopped (Figs. 4 and 6). In the stopped condition, the heat-sealing means 12 will be activated and at the same time, a next sheet S on top of the stack on the support 2 will be gripped (Fig. 7). The packed flower bouquet B will be released from the conveying means 6 in order to be discharged. The next flower bouquet B will be packed in the same way, leading to a fast and reliable manner of packing a flower bouquets B in conical sleeves.

[0029] The invention is not limited to the embodiment shown in the drawings and described herein before which may be varied in different ways within the scope of the appended claims. For example, the sheets of material can also be made of paper or of a combination of paper and plastic. In the case of paper as sheet material, the heat-sealing device will be replaced by a gluing device or the like.

Claims

1. Method of packing a flower bouquet in a conical cover made of sheet material (S), comprising the steps of:
 - providing at least one discrete sheet (S) of material,
 - bringing a flower bouquet (B) substantially in register with the sheet,
 - picking up the sheet and folding it around the flower bouquet, bringing together two opposed sheet edges so as to form a conical cover,
 - interconnecting the sheet edges to form the conical cover.
2. Method according to claim 1, wherein a stack of discrete sheets (S) is supplied.
3. Method according to claim 1 or 2, wherein the flower bouquet (B) is dropped onto the sheet to be folded around it.
4. Method according to one of the preceding claims, wherein the sheet (S) is gripped at its edges to be interconnected, and the edges are brought together, preferably by moving the sheet edges along converging paths such that the edges are brought together, preferably in an overlapped relationship, and attached.
5. Apparatus for packing a flower bouquet in a cover, comprising:
 - a support (2) for supporting at least a sheet (S) of material,
 - gripping means (8) for gripping two opposite edges of the sheet,
 - conveying means (6) to bring the gripping means from a position adjacent the edges of a flat sheet to a position adjacent to each other, and
 - connection means (12) for interconnecting the opposite edges of the sheet.
6. Apparatus according to claim 5, wherein the gripping means (8) are attached to the conveying means (6), which preferably comprises a set of endless conveyors (7), such as chain conveyor, adapted to move in a path from the support (2) to the connecting means (12).
7. Apparatus according to claim 6, adapted to form a conical cover from a sheet having a trapezoidal shape, wherein the path of the endless conveyors (7) includes a first part in which the conveyors (7) are inclined and converge in the direction of conveyance and a second part in which the conveyors (7) extend substantially parallel and adjacent to each other.
8. Apparatus according to any one of claims 5 - 7, further comprising vacuum means (10) co-operating with the gripping means (8) and adapted to lift the edges of the sheets (S) to enable the gripping means, preferably movable jaws, to grip the edges.
9. Apparatus according to any one of claims 5 - 8, further comprising supplying means, in particular a supply conveyor (5), to supply the flower bouquets (B) to the sheet support (2).
10. Stack of cover sheets (S) to be used in a method of packing a flower bouquet (B), said stack including a plurality of loose singular sheets having a substantially trapezoidal shape such that the sheets can be formed into a conical cover by connecting two similar edges.

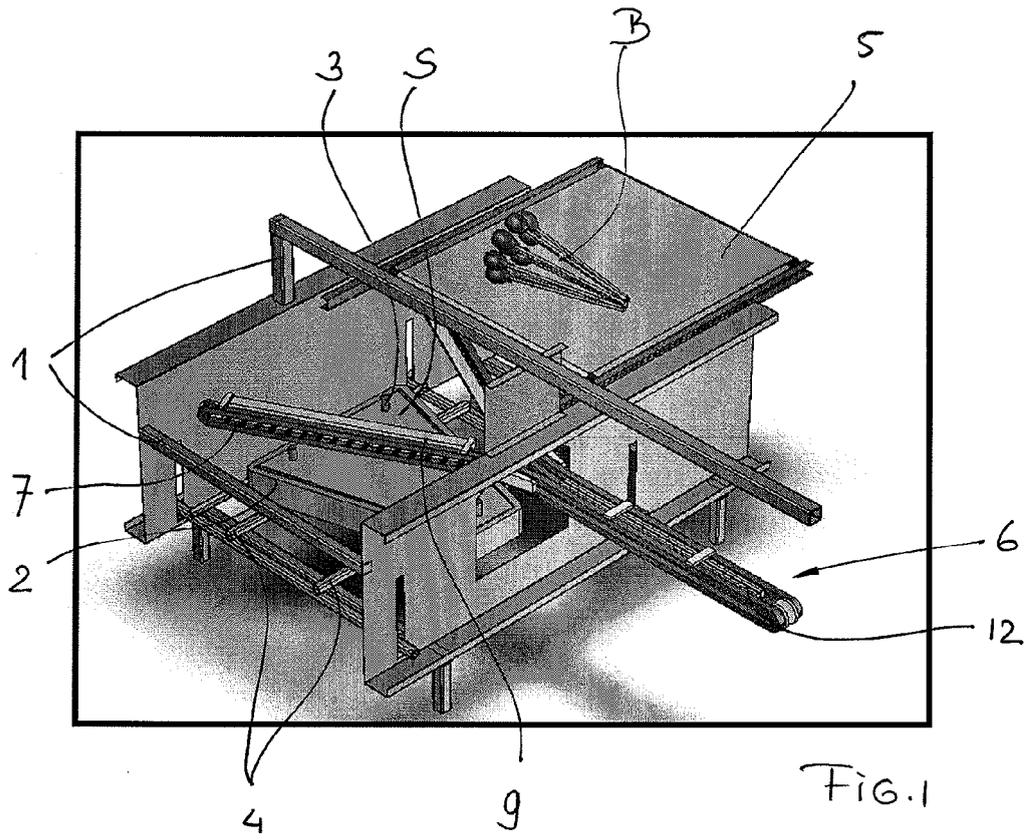


Fig. 1

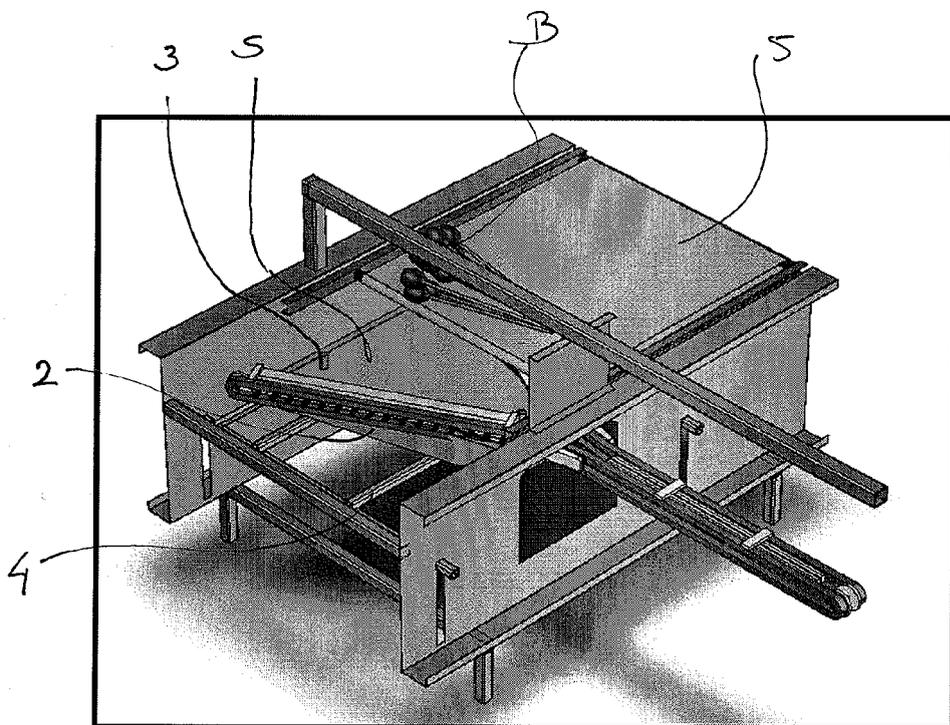
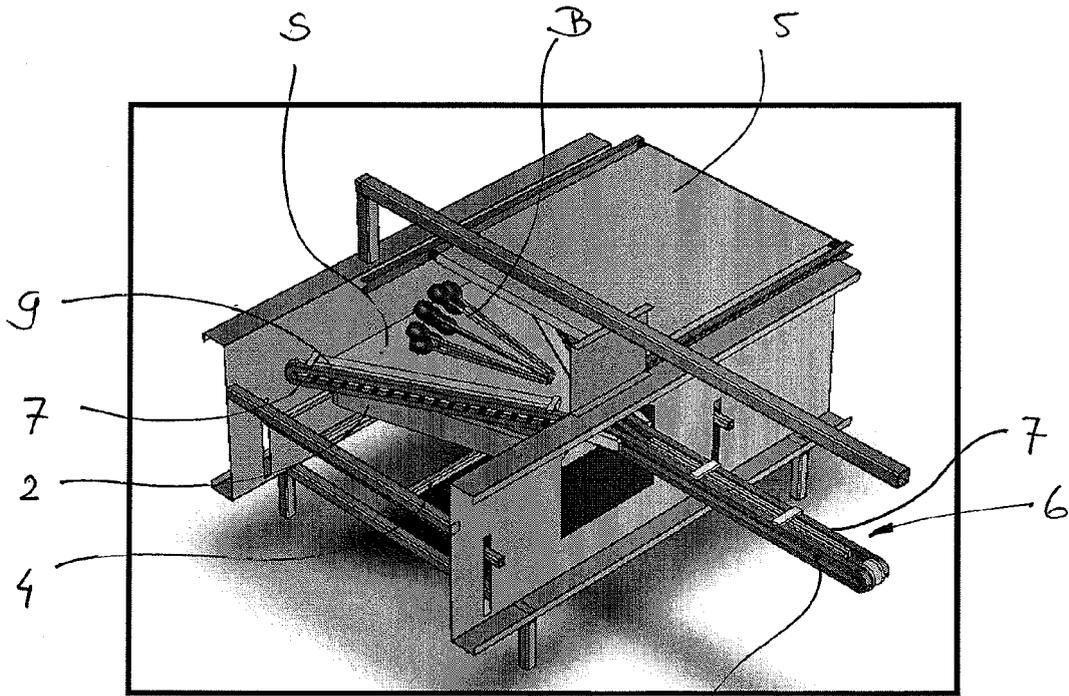
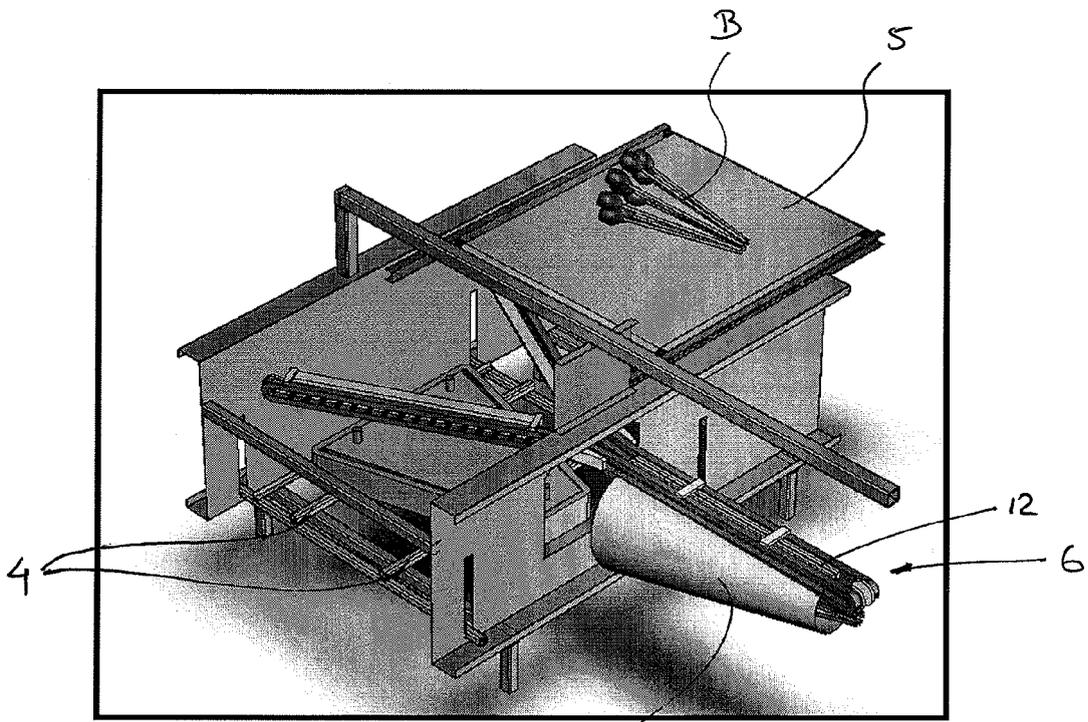


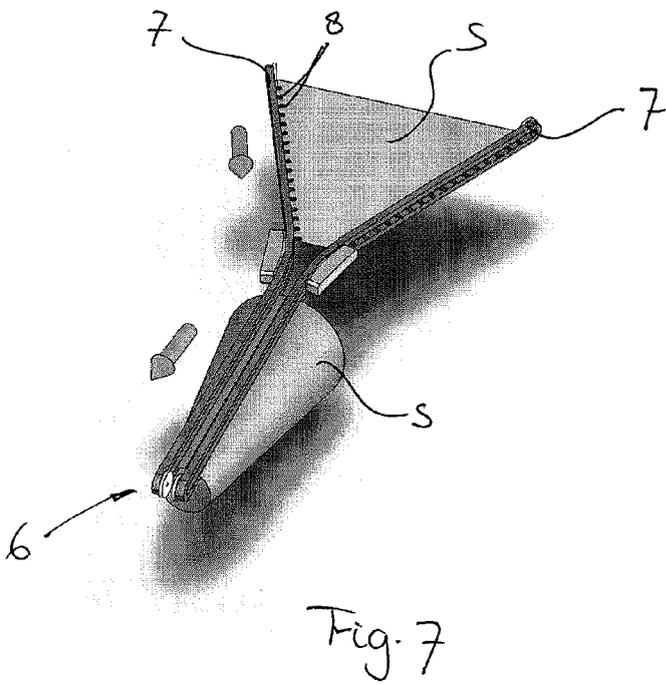
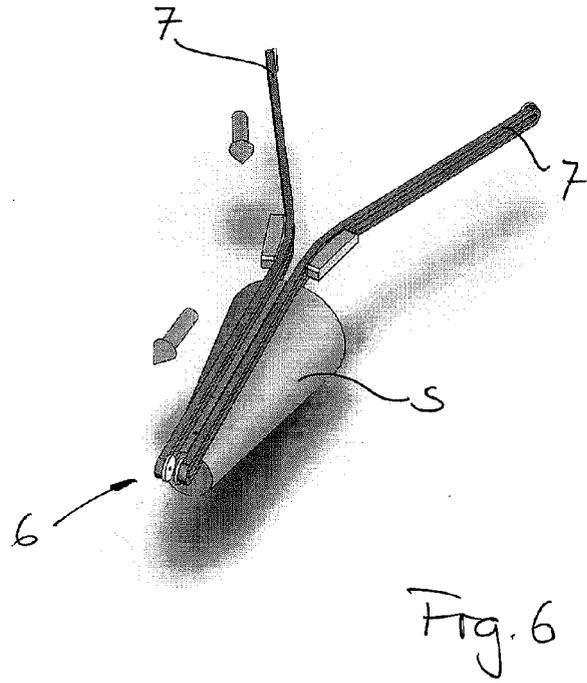
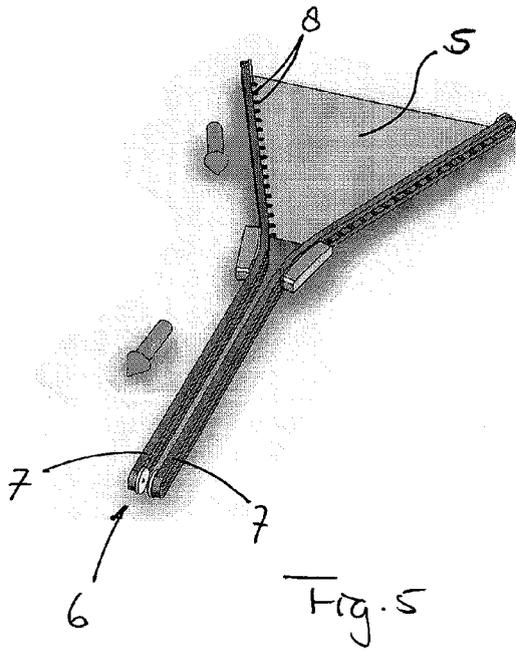
Fig. 2



7 Fig. 3



5 Fig. 4



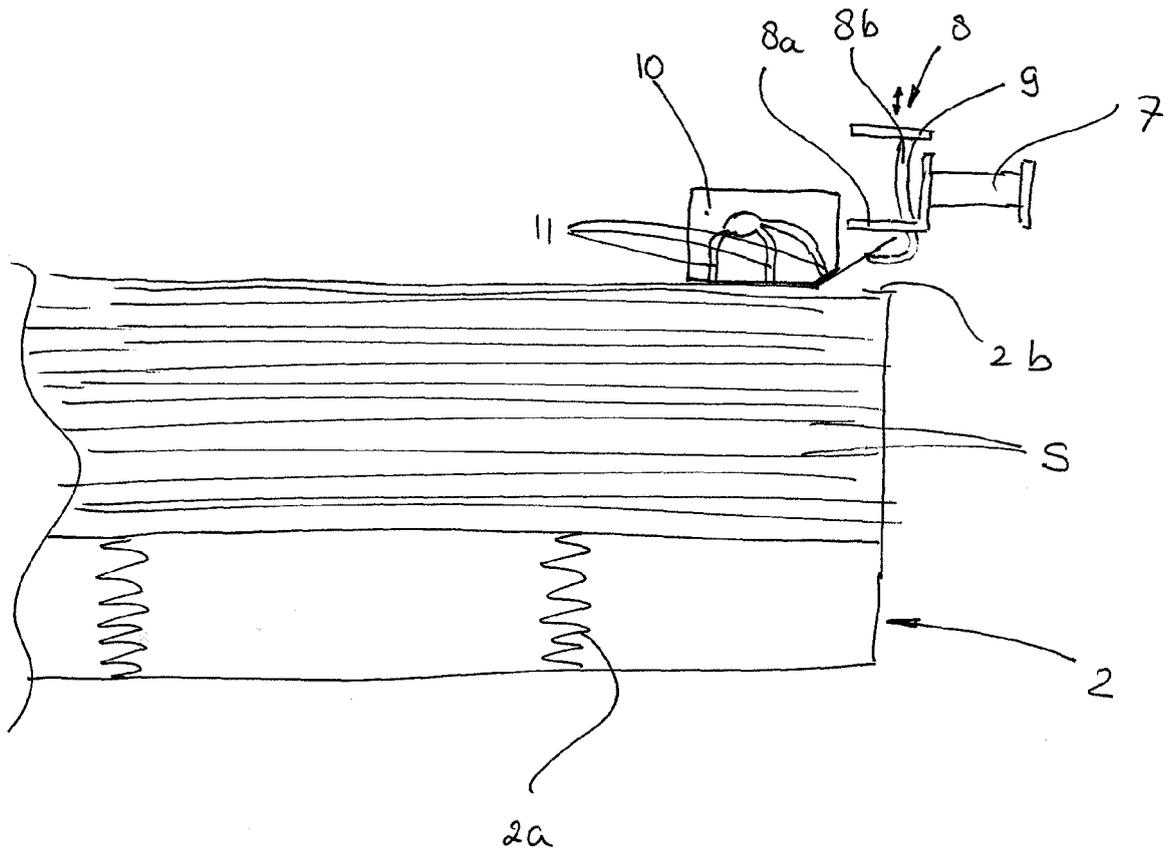


Fig. 8



DOCUMENTS CONSIDERED TO BE RELEVANT			
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Y	US 5 680 741 A (WEDER ET AL) 28 October 1997 (1997-10-28) * column 8, lines 33-44; figures 8-11 *	10	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 21 November 2005	Examiner Schelle, J
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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