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(54) Gripping conveyor belt for flower bouquets

(57) The invention relates to an automatized gripping transporter (2) for flower bouquets (1) to an attachment machine (10) for the automatized application of food bags (11) with strapping of the stems of the bouquets (1) and next discharging the bouquets (1) to a slanting discharge chute (13), in which the mentioned gripping unit (20) consists of a table unit (2) with two parallel longitudinal slots (3, 4) with below that a carriage (5) with eccentric gear

and telescopic part (6) for always feeding the food bags (11) in the correct way and at equal distances per mentioned longitudinal slot (3, 4) provided with gripping units (9) to always position the flower bouquets (1) very precisely on the attachment machine (10) and on the slanting discharge chute (13), so that in a surprisingly inventive way a feed and discharge device for processing flower bouquets (1) is created.

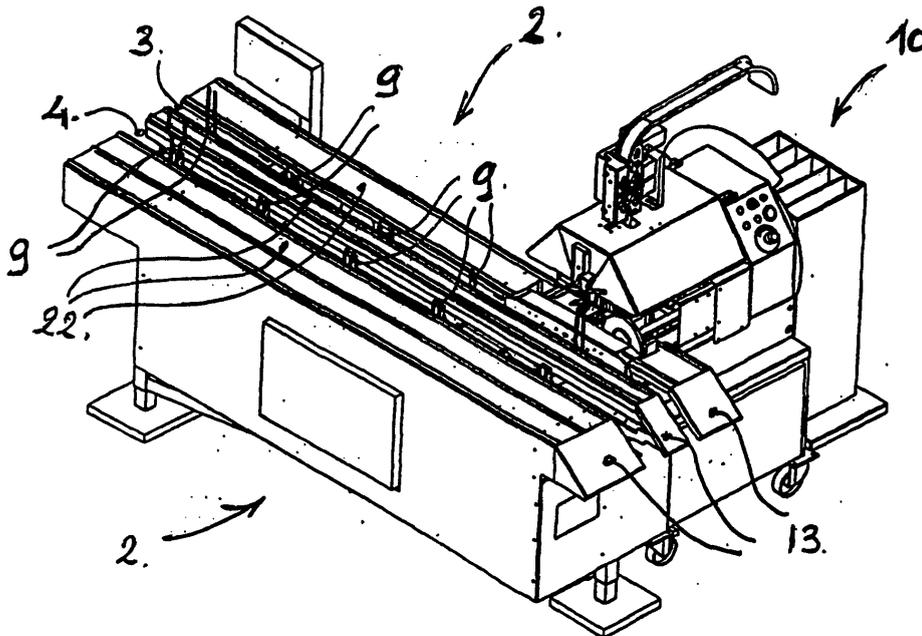


FIG. 1.

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Description

[0001] The present invention relates to a device for almost horizontally moving, transporting or feeding and discharging flower bouquets at accurate equal mutual distances to a machine for the automatized application of food bags while strapping the stems of the mentioned bouquets, mostly flowers.

[0002] The mentioned almost horizontally moving, transporting and especially feeding of the flower bouquets to a machine for automatized applying food bags to these bouquets was up till now done with a feeding belt with upright partitions, as described in the European Patent Application nr. EP 40476267.6, submitted on the 27th of April 2004, with applicant/inventor Van der LAAN, Paulus, Maria, TER AAR, The Netherlands, and titled: "Device for Automatized Attaching Food Bags to Bunches of Flowers". The machine for attaching food bag, during the tie up process of the stems of the flower bouquets with a strapping unit is automatized with a special rotation and translation arm near the elastic thread or elastic band around the stems of the flower bouquet on the work table together with the mentioned food bag. This procedure is perfectly executed by mentioned machine. Only with regard to the feed of the flower bouquets and to the rotation and translation arm a number of disadvantages occur. As it happens, the flower bouquets must be fed to the machine at accurate equal distances to the machine for attachment of the food bags to let the highly automatized process runs well, in which also the rotating and translation arm must be modified differently in an inventive way. The conveyor belt with the upright partitions at a mutual distance, in which the bouquets must be laid accurately between the mentioned partitions on the conveyor belt, does therefore not meet the requirements for a totally automatized process, in which the precise position of the feeding belt of the flower bouquets is a requirement. Also, the feed of the flower bouquets must be done very quickly, in which the rotation and translation arm must be constructed differently in order to be able to execute the whole process according to the invention in a suitable way.

[0003] It is the aim of the present invention to provide such an improved feeding belt or transporter to an attachment machine for food bags to flower bouquets, which does comply with the feeding demands of the machine for also automatized attachment of food bags to the flower bouquets and/or in which the aforementioned disadvantages are solved and in which a very fast automatized processing of the bouquets, of mostly flowers, is reached.

[0004] For this, a device for automatized almost horizontal feeding over a platform of flower bouquets to a machine for also automatized attachment of the food bags according to the invention is further developed in an inventive way, characterized in that the mentioned device is constructed of an elongated table unit with mutual parallel longitudinal slots, below which a freely back and forth moveably driven carriage is situated with a telescop-

ic part at the head end, on which at equal distances per mentioned longitudinal slot a separately driven gripping unit with rotatable, over an angle α , two finger elements is mounted, together with a specific swivelling arm on the application device, in which the whole mutual adjustment is automatically controlled.

[0005] The advantage is, that a very fast total process for attaching food bags to flower bouquets is achieved, by which a lot of manual work is replaced and the production speed and quality is strongly improved. This is an advantage for the competitive position of, for example, the flower grower.

[0006] Further, the device according to the invention is further developed in such a way, that the mentioned freely back and forth moveably driven carriage with a telescopic part at the head end is driven by an eccentric gear, which is provided with a motor, for example, an electromotor, in which the mentioned eccentric gear consists of a motor driven disc, which drives a bar hingeably along the circumference of it, which bar is hingeably connected with the mentioned carriage with telescopic part at the other end.

[0007] The advantages are, that a suitable timing in the feeding and processing of the flower bouquets is achieved and therefore a good and simple to control drive is possible.

[0008] Furthermore, the device according to the invention is further developed in such a way, that the mentioned separately driven gripping units with two finger elements, are driven rotatably pneumatically over an angle α of approximately 90 degrees from the approximately horizontal into the vertical position, in which in the longitudinal slot closest to the machine for the automatical application of food bags, on the finger elements of the mentioned gripping unit, almost straight rods are mounted and on the finger elements of the gripping unit in the second slot bent rods are mounted.

[0009] The advantages are, that the flower bouquets are accurately kept at mutual distances without damaging the bouquets and that the carriage with the folding in and out of the mentioned finger elements can move very freely with the flower bouquets below the table unit.

[0010] Furthermore, the device according to the invention is further developed in such a way, that the mentioned telescopic part can be slid out pneumatically over a suitably adjustable length L of, for example, approximately 60-100 mm and that the machine for application of the food bags is provided with a special gripping arm in the present process to quickly grab again a food bag for the next bouquet.

[0011] The advantage is, that the last flower bouquet, after being provided with the mentioned food bag, is quickly moved by the mentioned telescopic part, so that the machine, for automatized attachment of food bags, can quickly grab the next food bag with the mentioned special gripping arm, as further described in figure 5, and next the finished flower bouquet can be slid from the table in a slanting discharge chute in order to stack in transport

boxes. It so happens that the whole is driven with an eccentric moving device, so that the starting moment can be delayed, so that the above described solution is possible.

[0012] The preferred construction of the invention will be described by way of example, and with reference to the accompanying drawing.

[0013] In which:

Fig. 1 shows a top view in oblique projection of the gripping unit with coupled thereto the also automatized attachment machine for food bags according to a preferred embodiment and set-up of the invention;

Fig. 2 shows a top view of figure 1, in which the flower bouquets at accurate equal distances on the table unit with below the eccentrically geared carriage are clearly visible;

Fig. 3A-3E show schematic side views of the different phases or steps of the process for a gripped feed and discharge of the flower bouquets;

Fig. 4 shows a side view of the gripping unit with two angular moveable finger elements; and

Fig. 5 shows a schematic side view of the specially constructed gripping arm in two positions for the feed of the food bags.

[0014] Figure 1 shows a top view in oblique projection of the total set-up, consisting of an automatized gripping unit 2 and the known attachment machine 10 in order to provide the flower bouquets 1 of a food bag while strapping up the stems with an elastic band. The mentioned gripping unit 2 consists of an elongated table unit 22 with two parallel longitudinal slots 3 and 4, below which the eccentrically moveable driven carriage 5 with a telescopic part 6 at the head end. For clarification, see also figures 3A up to 3E. The carriage 5 is driven eccentrically with a disc 7 and a hinging bar 8 coupled thereto. On the carriage are mounted separate driven gripping units 9 at equal distances. Back to figure 1, the attaching machine 10 for the automatized application of the food bags 11 with matching elastic strapping is also shown. This attachment machine is further described in detail in the preamble of mentioned Patent document from the present applicant/inventor. The two devices or machines 2, 10 form a unit to finish off the flower bouquets 1 with food bags 11 and strap the stems.

[0015] Figure 2 shows in top view the set-up of figure 1. When the flower bouquet 1 is provided with a food bag 11 with an elastic band at the stems, the mentioned telescopic part 6 is pneumatically driven out and after pulling in the finger elements 12 (see figures 3A up to 3E) the flower bouquets 1 land on the slanting discharge chute 13 and next into a non indicated transport box. The table unit is preferably made of stainless steel.

[0016] Figures 3A up to 3E show in phases or steps

the process to provide the flower bouquets 1 with a food bag 11 with elastic strapping around the stem.

[0017] Figure 3A shows step 1 and there the gripping units 9 are in a completely open position with the finger elements 12 in an almost horizontal position below the table surface 14 of the table unit 2.

[0018] In figure 3B the finger elements 12 are hinged upwardly by, for example, pneumatic driving and the flower bouquets are fixed at table surface level 14. The equal distances are indicated by the dotted line 15. Next, the carriage 5 moves to the right according to arrow A (see figure 3B).

[0019] In figure 3C this horizontal movement has started and the telescopic part 6 has moved forward.

[0020] In figure 3D the most right position has been reached and the next flower bouquet 1 has reached the machine 10 to be provided with a food bag 11 with strapping of the stems and next the finger elements 12 fold downwards into the horizontal position and the last flower bouquet 1¹ falls onto the slanting discharge chute 13 and is removed (see also figure 3E). In the first longitudinal slot 3 the finger elements 12 are provided with straight rods and in the second longitudinal slot 4 the finger elements 12 are provided with bent rods.

[0021] In figure 3E the bouquet 1¹ falls off and the carriage 5 moves with folded in finger elements 12 to the left again and the whole procedure can start again from figure 3A.

[0022] Figures 3A up to 3E also show the working of the eccentric gear of the carriage 5.

[0023] Figure 4 shows a side view of the gripping unit 9 with the angular moveable finger elements 12, which unit is preferably driven pneumatically.

[0024] Figure 5 shows a side view of the specially constructed gripping arm 16 for feeding the food bags 11 for the strapping attachment around the stems of the bouquet of, for example, flowers 1. The gripping arm 16 is hingeably connected to the also automatized attaching machine 10. The whole of gripping transporter 2 with attachment machine 10 to a total working system coupled thereon is linked together with mutual software, through which very quickly and economically bouquets 1, of mostly flowers, can be processed. The gripping arm 16 consists of a second hinging arm 17 to grab and tear off the food bag 11 from the roll with the arms with the roughened surfaces 18 and 19 and next the whole turns to the right according to arrow X by driving the automatic powered pneumatic elements 20 and 21 into the dotted positions S to attach the food bag 11 with an elastic band to the stems of the bouquet 1.

[0025] Finally it has to be emphasized, that the above description constitutes a preferred embodiment of the invention and that further variations and modifications are still possible without departing the scope of this patent description.

Claims

1. Device for almost horizontally moving, transporting or feeding and discharging flower bouquets at accurate equal mutual distances to a machine for an automated application of food bags while strapping the stems of the mentioned bouquets, mostly flowers, **characterized in that**, the mentioned device is constructed of an elongated table unit (2) with mutual parallel longitudinal slots (3, 4), below which a freely back and forth moveably driven carriage (5) is situated with a telescopic part (6) at the head end, on which at equal distances per mentioned longitudinal slot (3, 4) a separately driven gripping unit (9) with, rotatable over an angle α , two finger elements (12) is mounted, together with a specific swivelling arm on the application device, in which the whole mutual adjustment is automatically controlled. 5
2. Device as claimed in claim 1, **characterized in that**, the number of longitudinal slots of the mentioned table unit is at least two. 20
3. Device as claimed in claim 1, **characterized in that**, the mentioned freely back and forth moveably driven carriage (5) with a telescopic part (6) at the head end is driven by an eccentric gear, which is provided with a motor, for example, an electromotor. 25
4. Device as claimed in claim 3, **characterized in that**, the mentioned eccentric gear consists of a motor driven disc (7), which drives a bar (8) hingeably along the circumference of it, which bar (8) is hingeably connected with the mentioned carriage (5) with telescopic part (6) at the other end. 30
35
5. Device as claimed in claim 1, **characterized in that**, the mentioned separately driven gripping units (9) with two finger elements (12), are driven rotatably pneumatically over an angle α of approximately 90 degrees from the approximately horizontal into the vertical position. 40
6. Device as claimed in claim 5, **characterized in that**, in the longitudinal slot (3) closest to the machine (10) for the automatical application of food bags (11), on the finger elements (12) of the mentioned gripping unit (9), almost straight rods are mounted and on the finger elements (12) of the gripping unit (9) in the second slot (4) bent rods are mounted. 45
50
7. Device as claimed in aforementioned claims, **characterized in that**, the mentioned mutual controls are done with a specific microprocessor, or other wise a PLC. 55
8. Device as claimed in claim 1, **characterized in that**, the mentioned telescopic part (5) can be slid out pneumatically over a suitably adjustable length L of, for example, approximately 60-100 mm and that the machine for the application of the food bags (11) is provided with a special gripping arm (16) in the present process to quickly grab again a food bag (11) for the next bouquet (1).
9. Device as claimed in claims 1-8, **characterized in that**, the mentioned carriage (5) with slid in telescopic carriage (6) in each longitudinal slot (3, 4) of the table unit (2) at converging equal distances of, for example, approximately 300 mm on the carriage (5) per longitudinal slot (3, 4), three gripping units (9) are mounted on the carriage (5) and a single gripping unit (9) is mounted on the telescopic part (6).
10. Device as claimed in aforementioned claims, **characterized in that**, the material of the construction and metal sheets of the mentioned table unit (2), carriage (5) with telescopic part (6) and eccentric gear are preferably constructed of stainless steel.

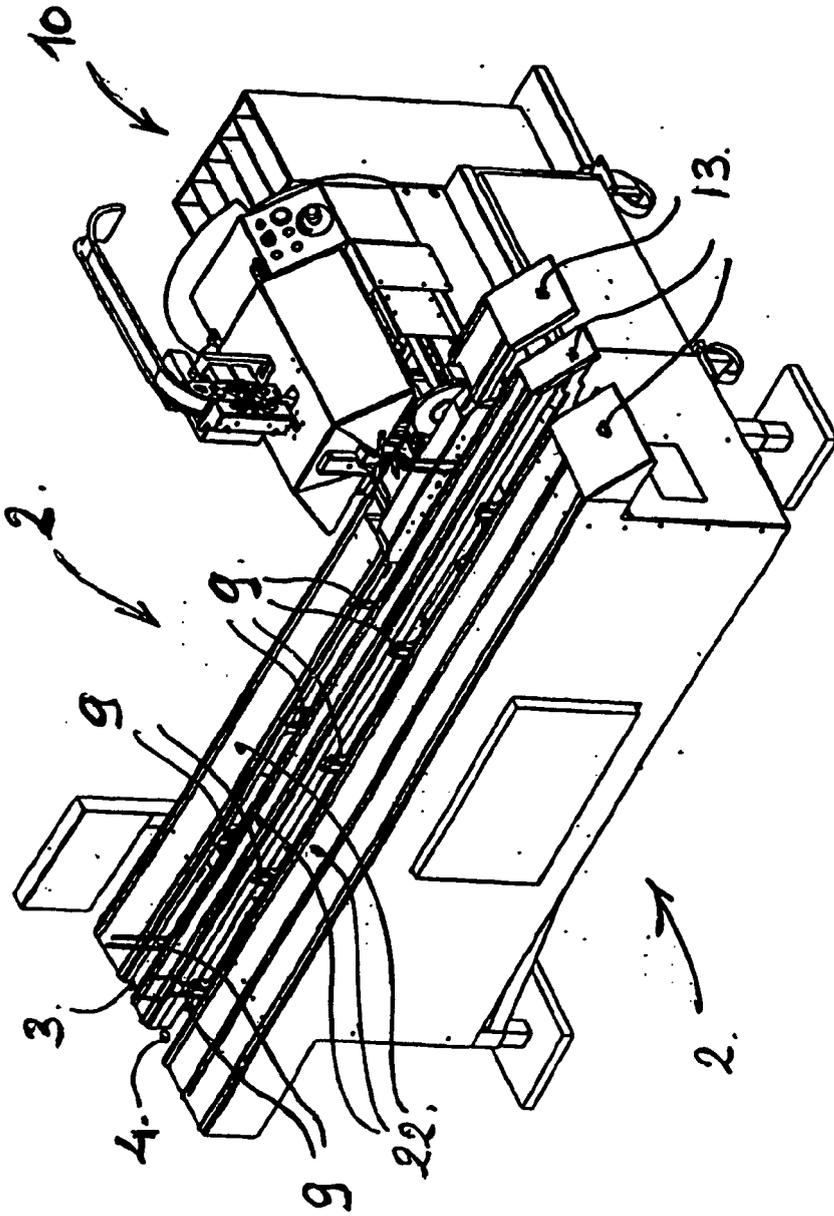


FIG. 1.

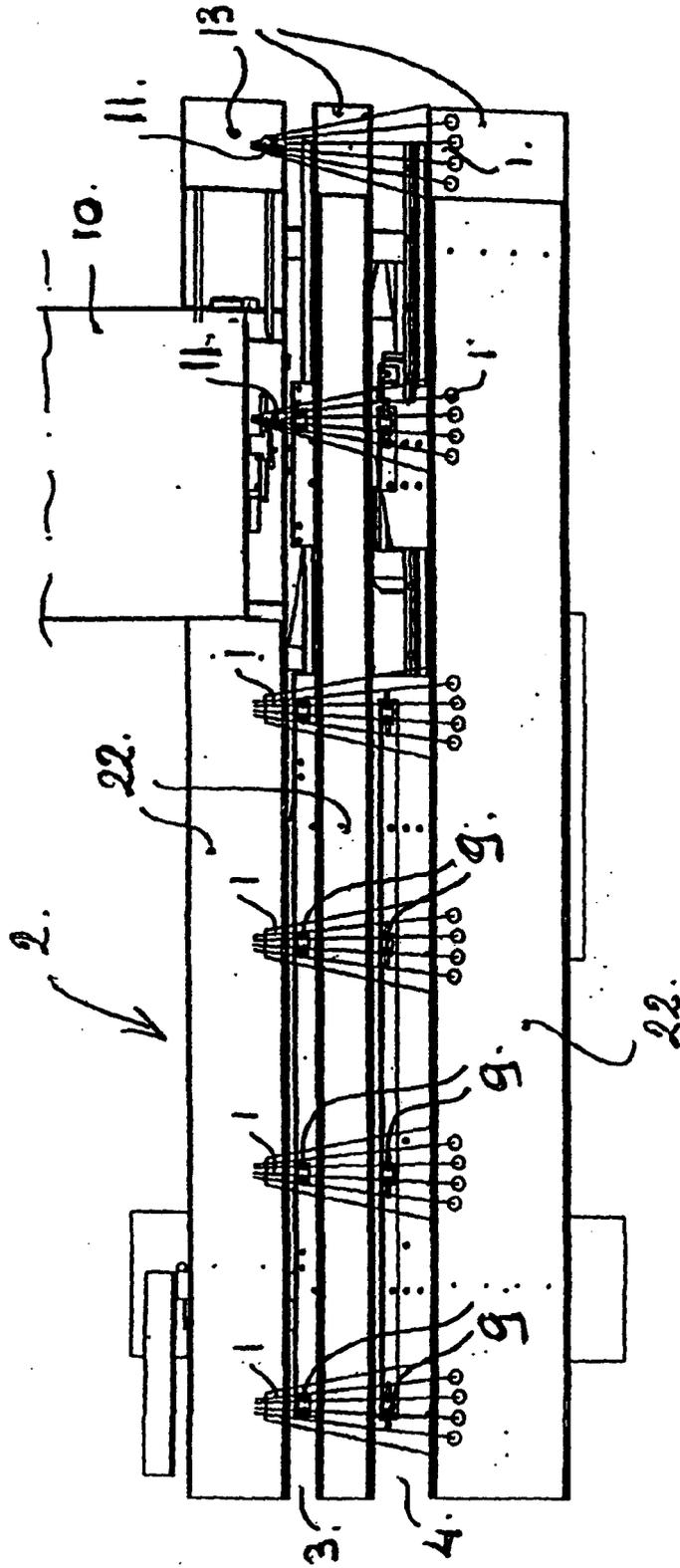


FIG. 2.

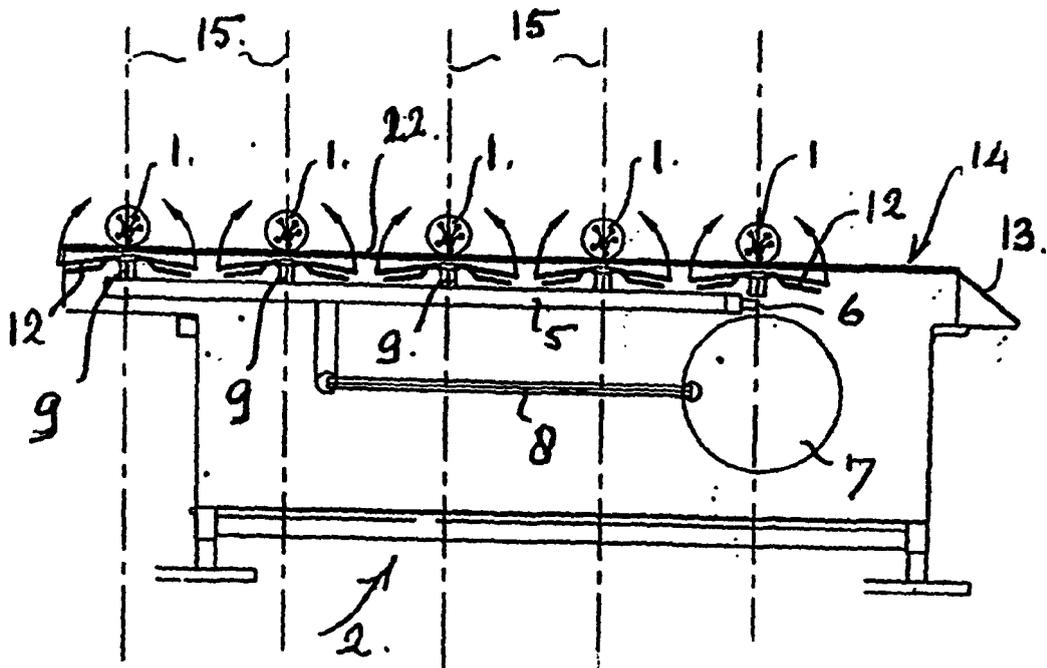


FIG. 3A.

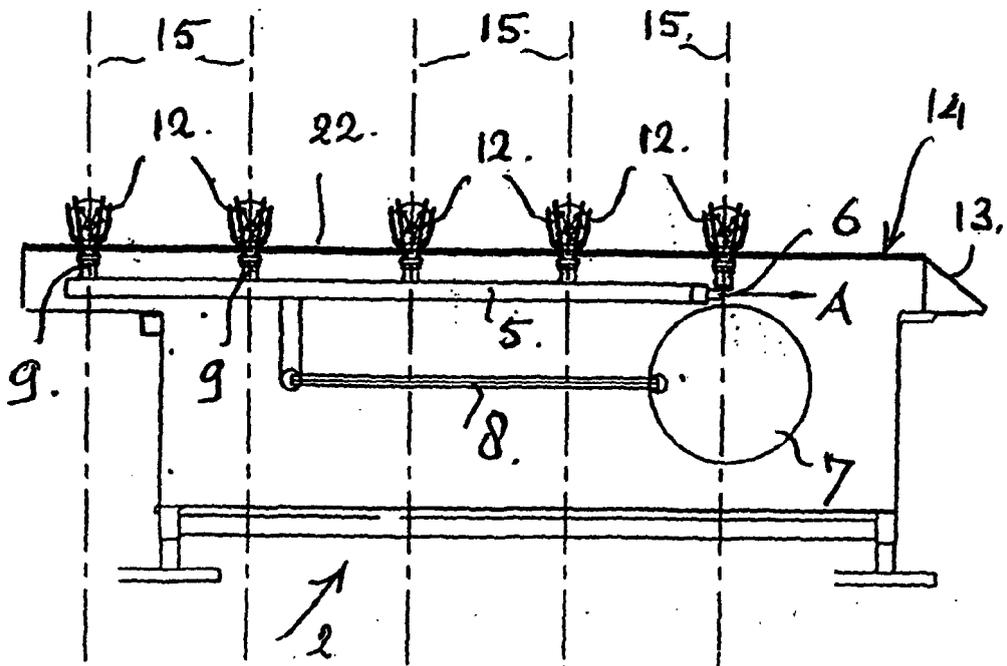


FIG. 3B.

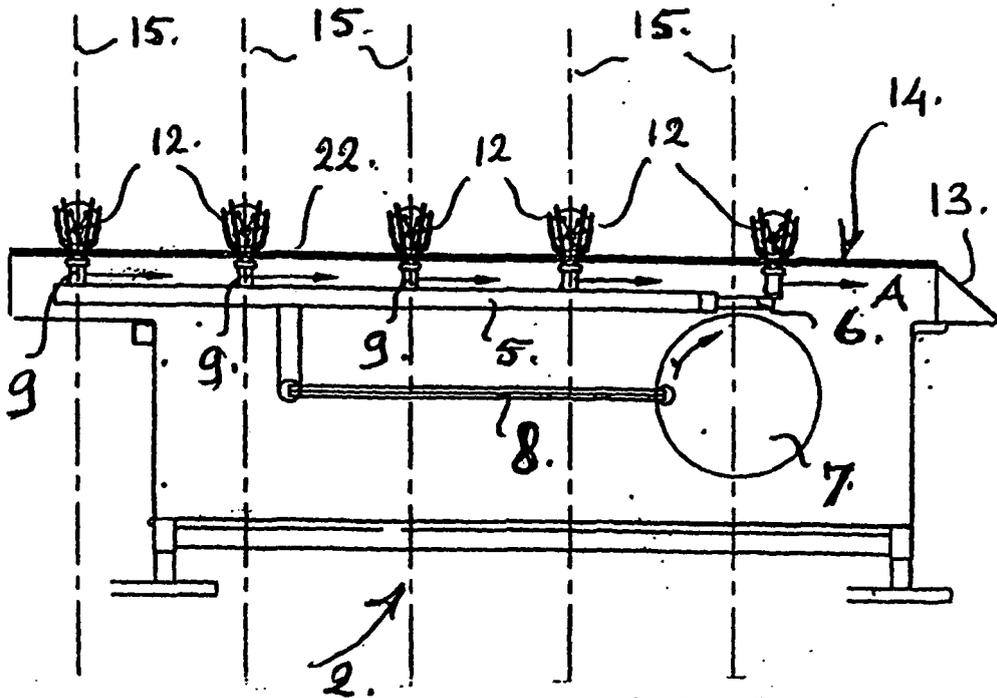


FIG. 3C.

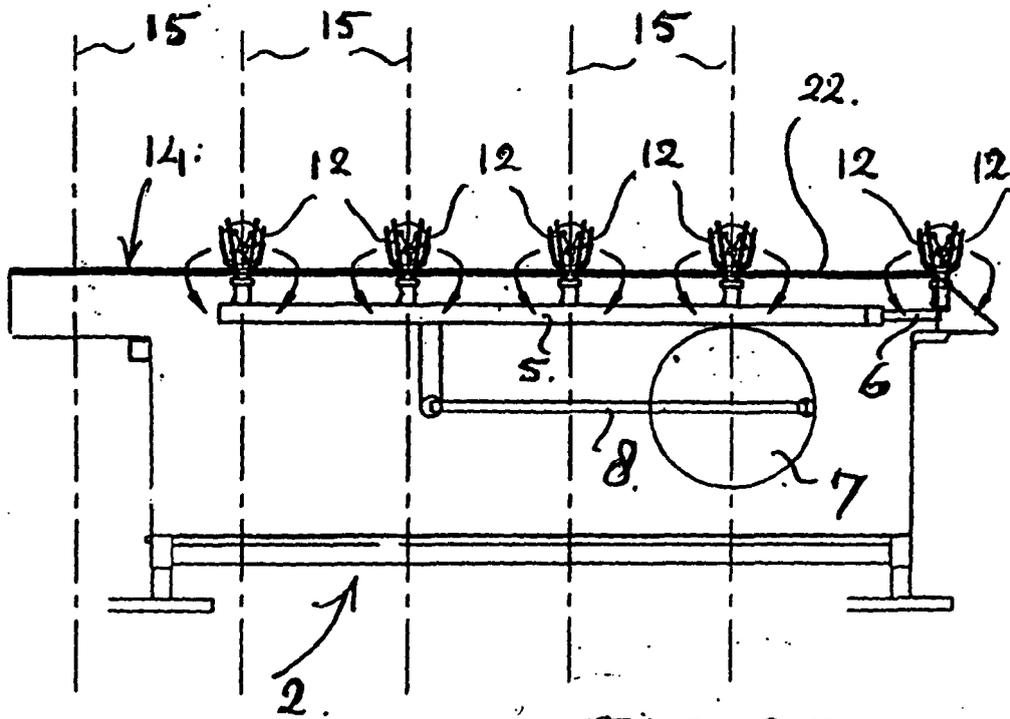


FIG. 3D.

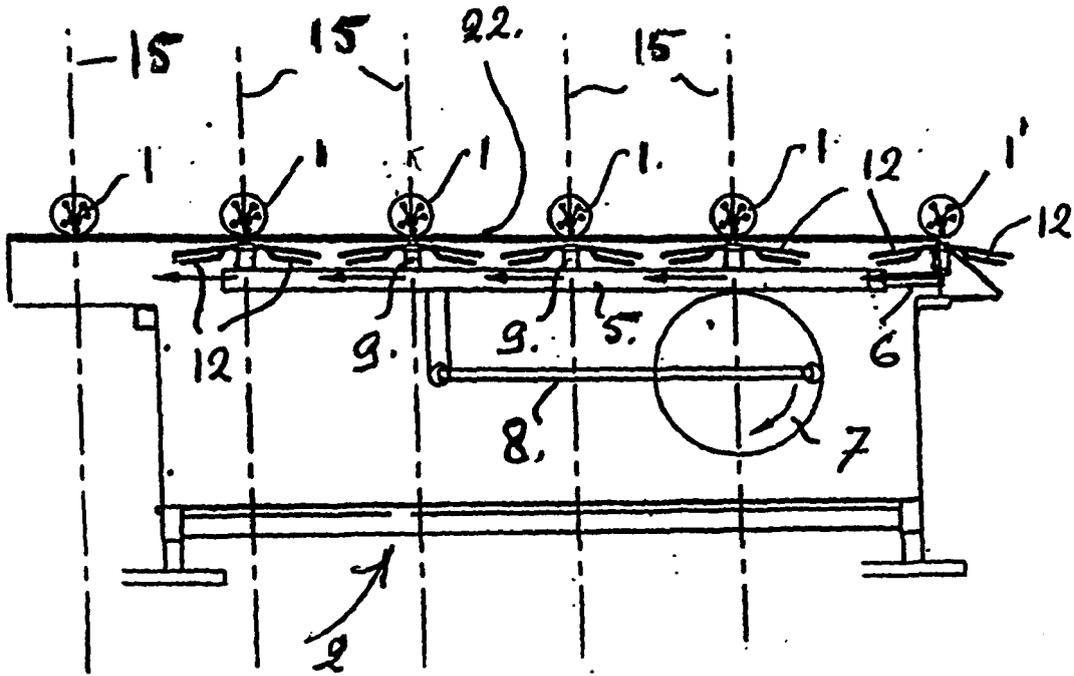


FIG. 3E.

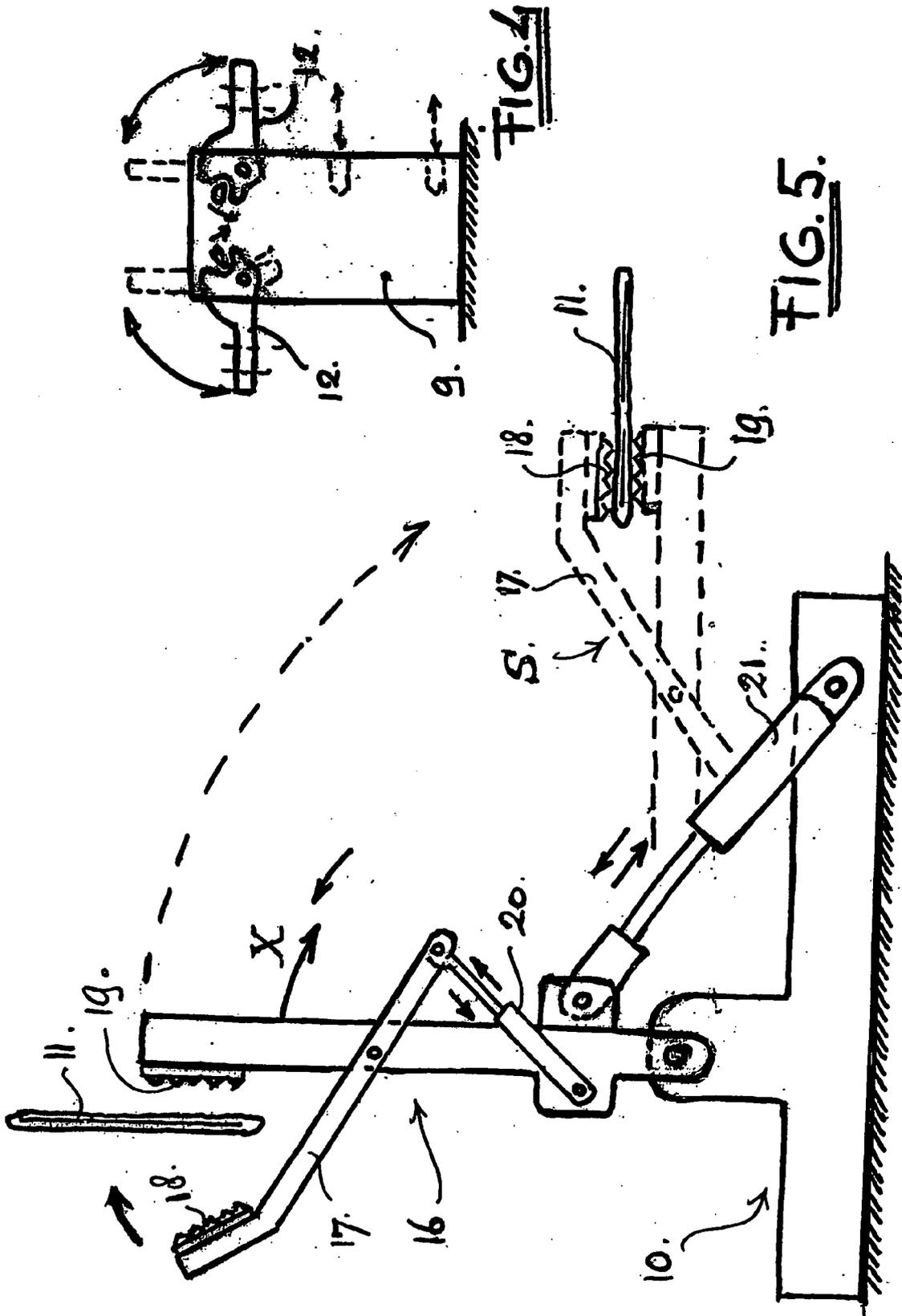


FIG. 4

FIG. 5



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 1 495 971 A (DEN BERG MACHB BLOKKER B V VAN [NL]) 12 January 2005 (2005-01-12) * the whole document *	1-10	INV. B65B25/02
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		16 February 2007	Vigilante, Marco
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EP 06 07 6777

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16-02-2007

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