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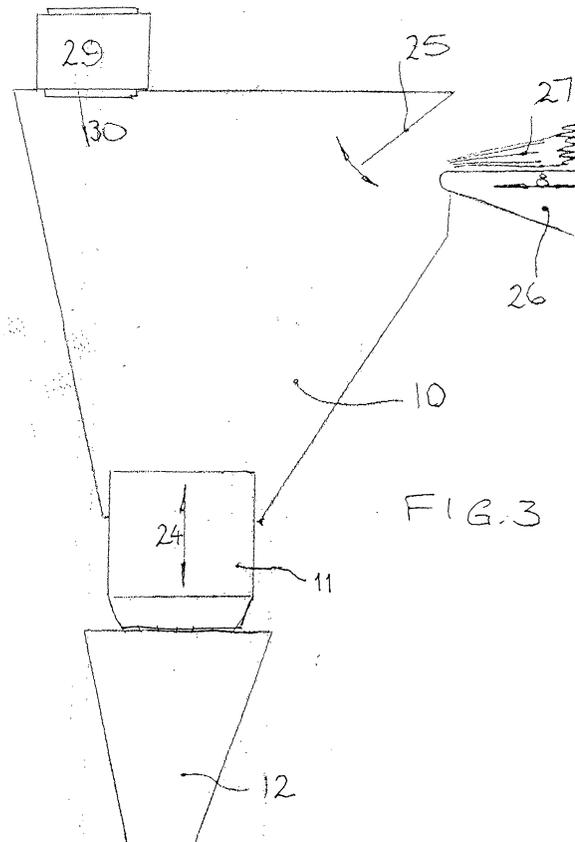
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(54) **Device for inserting bouquets into wraps**

(57) A wrap filling mechanism comprises a wrap holder 12 with a chute 10, 11 above it. Blower means 29 provide a downward air pressure in the chute. This downward air pressure provides a force additional to gravity, resulting in expansion of the wrap to its full extent and a more reliable passage of the bouquets 27 through the chute and into the wraps. Flap means 25 are opened to allow the passage of a bouquet and closed to raise the pressure behind the bouquet after it has passed the flap means. The flap means may be positively controlled, eg by bouquet position sensors and opening and/or closing actuators, or may be passively operated by the force of a bouquet being pushed against it and spring-loading.



Description

[0001] The present invention relates to the filling of conical wraps with bouquets of flowers and the like.

[0002] Apparatuses have been proposed for the automatic production of bouquets of flowers wrapped in conical wraps. One such apparatus is described in WO 01/10634 A1. In that and some other apparatuses, the conical wraps are preformed. A wrap is held at a filling station in the open position (after being opened from the flat state if necessary) with its wide end upwards. The bouquet is then dropped into the wrap through a chute from above by gravity. Once the bouquet is in the wrap, it can be moved to other stations if desired for further operations such as applying labels, and eventually discharged.

[0003] If the wrap can be supported sufficiently well, then this process is satisfactory. However, it may be difficult or impossible to support the wrap sufficiently firmly. The bouquet may have projecting leaves or side branches near its bottom end, and its direction of fall cannot be controlled accurately. It may therefore strike the side of the wrap and catch on the wrap at that point, instead of passing cleanly to the bottom end of the wrap, so causing the wrap to buckle, fold, or bend. In addition, the upper edge of the wrap may be distorted from the ideal circular shape, so that the bouquet may catch on that upper edge.

[0004] A technique is known for assisting in the accurate filling of sleeves with pot plants. In this known technique, an annular mounting collar has several arms mounted around it, each arm carrying on its inner end a downwardly pointing tang. The arms are linked so that they can all be turned together to bring their tangs towards or away from each other. The tangs effectively form the vertexes of a polygon which can be expanded and contracted.

[0005] In use, the tangs are brought together and the collar is lowered towards the open mouth of the sleeve. The arms are then rotated so as to move the tangs outwards. As they move outwards, the tangs engage against the inner face of the mouth of the sleeve, and pull that mouth into the form of a regular polygon. The tangs are moved until the material of the sleeve around its mouth is taut or nearly so.

[0006] This method seems to work well on sleeves for pot plants that are made from polyethylene which stretch easily and resist tearing. However, it is often desirable for the sleeves for cut flowers have a high lustre and sparkle. Such sleeves therefore have to be made from another material, generally polypropylene. This material is likely to tear when subjected to the mechanism just described.

[0007] Another technique, which can be used alone or together with the technique just mentioned, is to lower the bottom end of the chute into the wrap to assist in accurate movement of the bouquet into the wrap. To permit the movement of the chute into the upper open end

of the wrap, the chute is desirably telescopic, its upper end being fixed for the delivery of bouquets into it. This may therefore provide a certain resistance to the passage of the bouquet through the telescopic throat. Further, in the case of bouquets which are being formed for onward transmission, eg to retailers, it is desirable for the bouquets to be packed as tightly as possible. In this situation, it is therefore desirable for the chute to hold the bouquet fairly tightly, to prevent it spreading out and so taking up more space.

[0008] In all these arrangements, there is the danger that a bouquet may catch during its passage through the chute and into the wrap, so becoming lodged or stuck in the chute or wrap before reaching its intended position with its bottom end protruding through the bottom end of the wrap. Sufficient clearance must obviously be provided for the bouquets to pass through the chute without becoming stuck. This can adversely affect the tightness of the resulting wrapped bouquet. Also, if the bottom end of the bouquet (with the ends of the relatively hard flower stems) contacts the side of the wrap, it is liable to tear the wrap.

[0009] The general object of the invention is to alleviate this problem.

[0010] According to the invention, there is provided a wrap filling mechanism comprising a wrap holder with a chute above it, **characterized by** blower means for providing a downward air pressure in the chute. This downward air pressure provides a force additional to gravity, and results in a more reliable passage of the bouquets through the chute and into the wraps. It also provides a significant expansion force tending to blow the wrap fully open.

[0011] Preferably flap means are provided which are opened to allow the passage of a bouquet and closed to raise the pressure behind the bouquet after it has passed the flap means. The flap means may be positively controlled, eg by bouquet position sensors and opening and/or closing actuators, or may be passively operated by the force of a bouquet being pushed against it and spring-loading.

[0012] A wrap filling mechanism embodying the invention will now be described by way of example and with reference to the drawings, in which:

Fig. 1 is a side view of a chute above a packet of sleeves;

Fig. 2 is a top view of a packet of sleeves; and

Fig. 3 is a side view of the chute with its hopper.

[0013] Fig. 1 shows the lower end of the mouth part 11 of a chute down which the cut flowers may be guided, from an elevator or other infeed device or conveyor. A booklet 16 of sleeves in flat form is held against a platen 12 by means of pins 13 and clamps 14. Typically, commercial sleeves are made with perforations 15 along which they are torn from the booklet, and with the front (top) sheet of each sleeve shorter than the rear (bottom)

sheet.

[0014] Fig. 2 shows the booklet 16 and associated elements from above. The top wrap 17 is opened by pulling the front face with a device 20, which can conveniently be a vacuum device, along axis 21. The mechanism, vacuum or otherwise, is unable to consistently open the wrap to form a perfectly round shape. Also, if the apparatus is such that there is a gap 18 between the wrap and the chute, there is a high risk of the flowers and leaves catching on the edge of the wrap and causing an unattractive presentation.

[0015] In some cases it may be possible to lower the chute mouth inside the wrap, but in most cases this is not possible, due to the danger of the volume of flowers in the wrap becoming lodged in the throat of the chute. Also, where near fits may seem to make moving the chute mouth practical, the uneven pulled shape 12 may make it impractical.

[0016] Fig. 3 shows the chute mouth 11 mounted in the bottom of a hopper or guide unit 10 forming, with the chute mouth 11, the chute assembly. The chute mouth is lowered along axis 24 to engage with the open end of a wrap, and raised after a bouquet has entered the wrap. As the chute is lowered into the mouth of the wrap, so air from the blower is directed into the wrap. This expands the wrap to its full extent, removing any folds, creases, or wrinkles; the chance of the bouquet catching on the side of the wrap is therefore reduced.

[0017] The hopper or upper part of the bouquet funnelling and guidance system has a bouquet 27 fed into it from a feed mechanism, such as an elevator or conveyor belt, 26. The bouquet falls into the hopper and turns into the required vertical position during the initial part of its fall. It then completes its passage into the wrap stems first. The hopper 10 and chute mouth 11 must be shaped and sized to substantially obviate the danger that the bouquet may become caught in the hopper or on the top edge of the chute mouth.

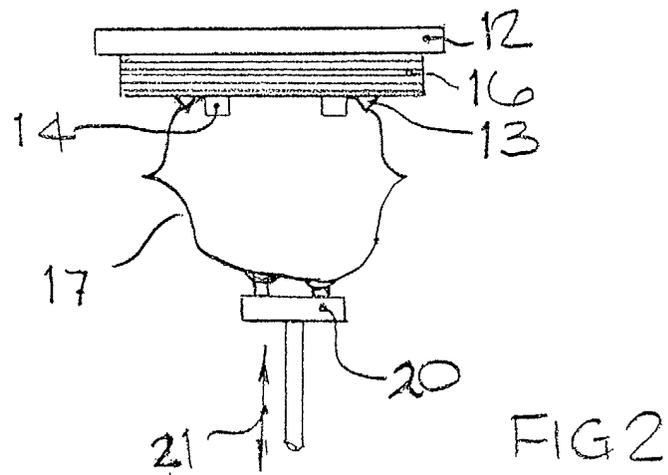
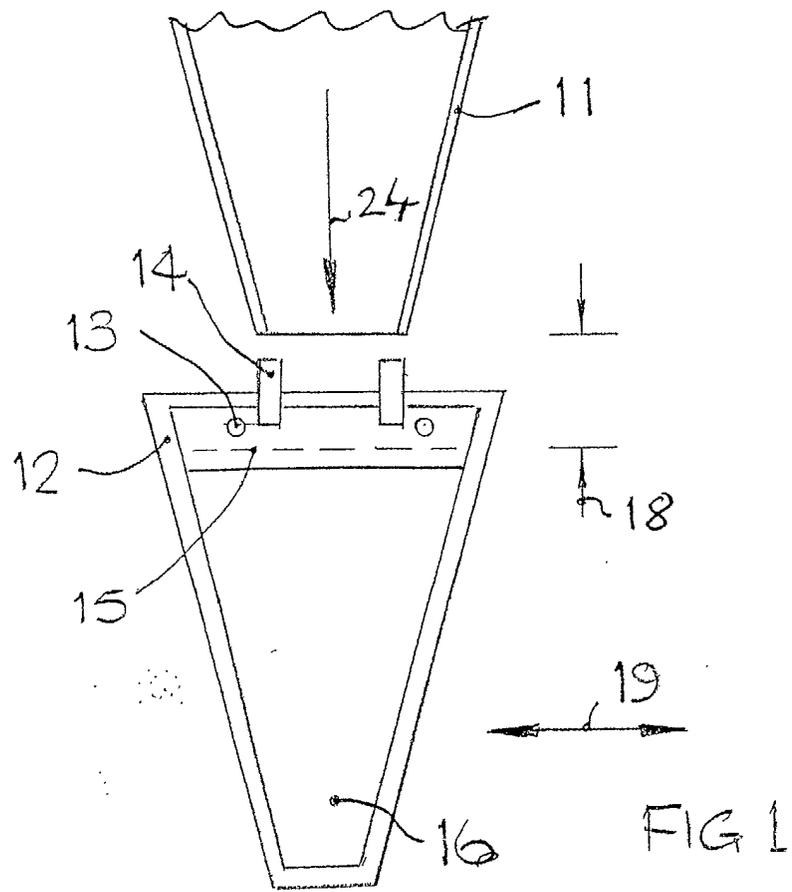
[0018] The hopper 10 is a closed space, as shown. After the entry of the bouquet into the hopper, a door 25 is closed. If desired, sensor means (not shown) may be provided for sensing the passage of the bouquet at various points and used to control the opening and/or closing of the door or flap 25. A fan or blower 29 is installed on the top of the hopper, and passes air into the closed hopper or funnel chamber. The passage of the bouquet through the restricted section of the funnel and chute 11 is assisted by the air thrust, ensuring positive and damage-free placement in the wrap.

[0019] The air thrust may also be of added advantage in cases where delicate flowers are being packed that need to be handled gently. The drop can be reduced by the air assistance, thereby reducing the impact damage to the young buds.

Claims

1. A wrap filling mechanism comprising a wrap holder (12, 13, 14, 20) with a chute (10, 11) above it, **characterized by** blower means (29) for providing a downward air pressure in the chute (10, 11).
2. A wrap filling mechanism according to claim 1 **characterized by** flap means (25) which are opened to allow the passage of a bouquet (27) and closed to raise the pressure behind the bouquet after it has passed the flap means.
3. A wrap filling mechanism according to claim 2 **characterized in that** the flap means are positively controlled by bouquet position sensors and opening and/or closing actuators.
4. A wrap filling mechanism according to claim 2 **characterized in that** the flap means are passively operated by the force of a bouquet being pushed against it and spring-loading.

Any novel and inventive feature or combination of features specifically disclosed herein within the meaning of Article 4H of the International Convention (Paris Convention).



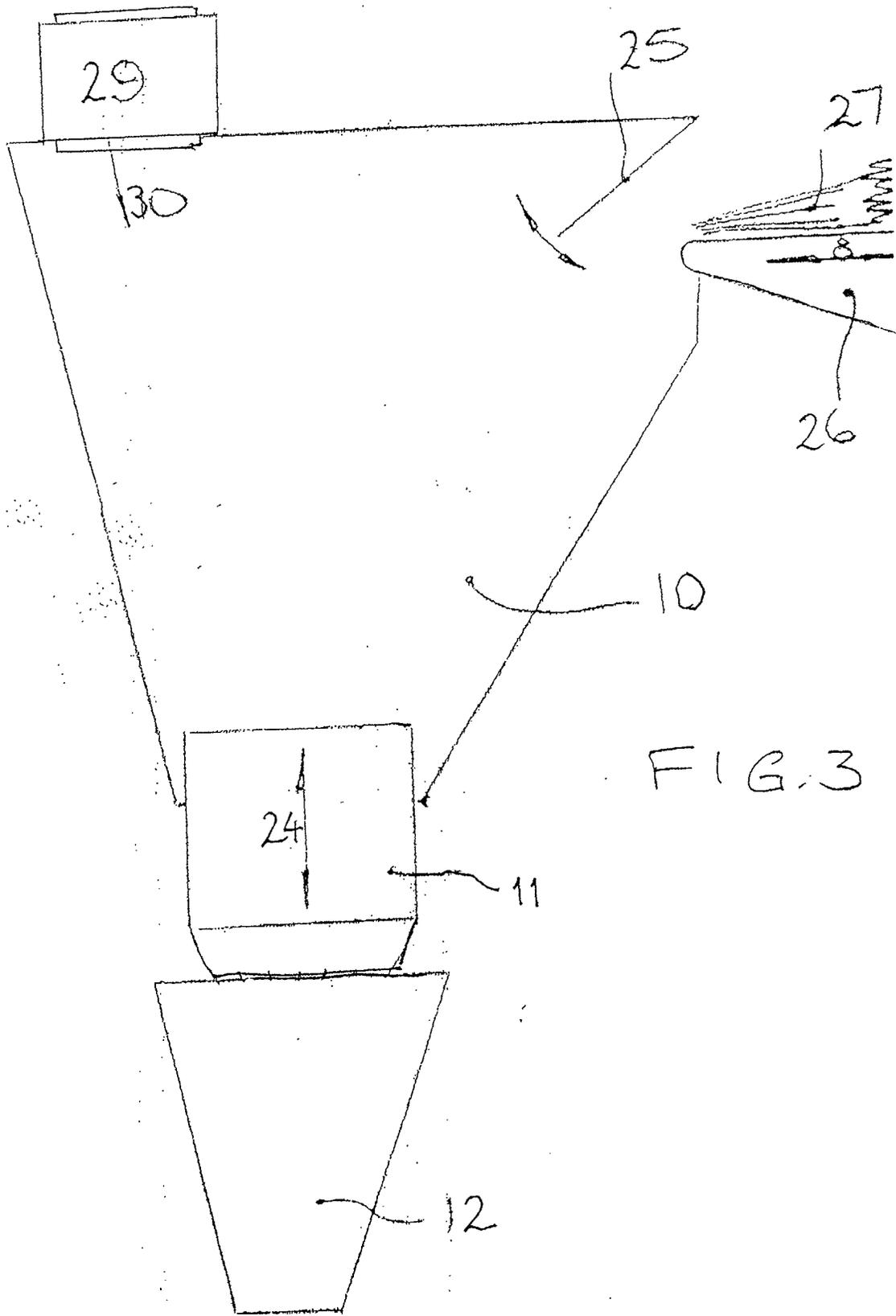


FIG. 3



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 02 25 3107

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)
X	US 4 969 314 A (DAVIS ROBERT) 13 November 1990 (1990-11-13) * figure 7 *	1	B65B25/02 B65B39/00
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65B
Place of search	Date of completion of the search	Examiner	
THE HAGUE	29 July 2002	Vigilante, M	
CATEGORY OF CITED DOCUMENTS		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	
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		& : member of the same patent family, corresponding document	

EPO FORM 1503 03/82 (P04001)

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

EP 02 25 3107

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
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29-07-2002

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EPC FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82