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(71) Applicant: **MAVECO B.V.**
Bevrijding 43
NL-7121 WP Aalten(NL)

(72) Inventor: **Soyer, Gerardus Petrus Jozefus**
Bevrijding 43
NL-7121 WP Aalten(NL)

(74) Representative: **Schumann, Bernard Herman Johan et al**
OCTROOIBUREAU ARNOLD & SIEDSMA
Sweelinckplein 1
NL-2517 GK The Hague(NL)

(54) **A method and an apparatus for wrapping a piece of meat.**

(57) The invention provides a method for preserving a piece of meat by tightly wrapping the meat with a moisture-tight, stretchable foil. The moisture-tight wrapping prevents evaporation and drainage of body liquids from the meat during for instance cooling thereof. The weight loss caused by the loss of body liquids is hereby considerably reduced.

The invention also provides an apparatus for performing the method.

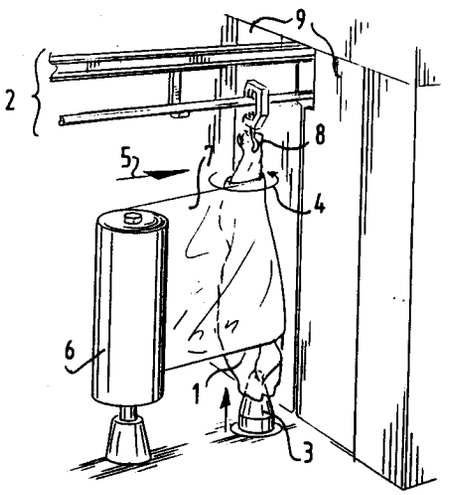

FIG.1

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The invention lies in the field of preserving a piece of meat, for instance for transport.

A pig normally has a body temperature of about 37 ° C. During the slaughtering process this temperature increases slightly to for instance 38-39 ° C as a consequence of after-treatments such as heating with boiling water or steam and scorching. Before the meat can be transported it must have a temperature of 6-7 ° C right into the core.

After slaughtering the pigs are placed, optionally divided into two parts, into a cold room where, at a temperature of minus several tens of degrees Celsius, they are eventually brought to a core temperature of 6-7 ° C. A considerable evaporation of moisture and draining of body liquids are found to occur here. In all, this entails a considerable weight loss. This weight loss normally lies in the order of 2-3%.

Contamination due to unhygienic handling of pieces of meat frequently takes place prior to transport.

The object of the invention is to provide a method which obviates the above described drawbacks of the prior art. In this respect the invention provides a method for preserving a piece of meat, for instance for transport, comprising the steps of:

(1) slaughtering an animal;

(2) optionally dividing said animal into two or more parts immediately thereafter;

(3) providing a strip of moisture-tight, stretchable foil; and

(4) tightly wrapping the slaughtered animal or the relevant parts thereof with the foil immediately thereafter such that the foil encloses the animal or the parts in substantially moisture-tight manner.

The phrase "immediately thereafter" is used to make it clear that according to the invention the meat is wrapped in foil when still warm. Should there be a considerable waiting time before wrapping, considerable moisture loss, and therewith weight loss, will already have occurred due to evaporation and draining. The tight wrapping is essential in order to achieve that no or at least negligible air inclusions can be present between the foil and the outer surface of the meat. These can function as insulating locations, therefore as heat resistances, whereby the cooling process may take place at reduced speed. As a result of the locations with increased heat resistance the cold is less capable of penetrating to the core of the meat.

The method according to the invention has been found capable of reducing the weight loss through evaporation and drainage to around 0.2%, while in practice the packaging costs are almost negligible in comparison to the economic advantage achieved herewith.

It is also apparent that the method according to the invention offers a great hygienic benefit and that the pieces of meat are very simply sealed from contaminating influences from outside. The method is therefore exceptionally suitable for transport purposes.

It is noted that it is essential that the foil is arranged tightly round the meat. This assumes a sufficient tensile stress in the foil during arranging.

A specific embodiment of the method comprises the step of

(5) performing step (4) such that the foil extends in one layer with overlapping edge zones.

An embodiment that is simple and practical of realization is that comprising the step of

(6) performing step (5) such that the foil extends in helical form.

The foil can for instance be a PE-foil with a thickness in the order of for example 15 μm. Such a foil is generally known and is employed for pallets.

The invention further offers a method with the step of

(9) performing step (3) with a shrink foil that shrinks at a temperature which during wrapping lies just below the temperature of the slaughtered animal or the relevant parts. Thus ensured in very simple manner is a very good contact of the foil on the irregular meat surface.

The invention further relates to an apparatus for performing the above described method. This comprises:

means for positioning a slaughtered animal or at least one relevant part thereof;

supply means for feeding a strip of moisture-tight, stretchable foil;

wrapping means for wrapping an animal or the or each part with that foil.

In a particular embodiment this apparatus has the special feature that it comprises two or more foil delivery devices which are rotatable round a common axis round a positioned animal or part and which are positioned at substantially equal mutual angular distances. Thus ensured is that no asymmetrical forces are exerted on a piece of meat for wrapping which could make the wrapping process difficult or cause disturbances. It must of course be ensured in all conditions that the piece of meat is positioned such that during wrapping it does not tend to start rotating with the foil due to the tensile stress therein.

A preferred embodiment has the feature that the supply means wrap the foil in helical manner round the animal or part.

Use can be made of a pre-stretched foil which, after arranging of the foil around the piece of meat,

undergoes shrinkage such that once again a close-fitting packaging is ensured.

In addition to the above mentioned technical advantages the invention also offers the possibility of allowing the wrapping to take place fully automatically, while an aesthetically exceptionally good product can be supplied.

The invention will now be elucidated with reference to the annexed drawing. In the drawing:

figure 1 shows a schematic perspective view of a first embodiment;

figure 2 shows a schematic perspective view of a second embodiment;

figure 3 is a schematic perspective view of a third embodiment;

figure 4 shows a schematic perspective view of a fourth embodiment; and

figure 5 shows a cross section through the sealing member of figure 4.

Figure 1 shows a pig 1 suspended in known manner on a hook 8 supported by a rail system 2. In the position shown in figure 1 the pig is temporarily held still by means of a positioning head 3 which can be moved upward by means (not drawn) for gripping the pig 1 and rotating thereof according to arrow 4. Disposed adjacent to the path of the pig 1 (arrow 5) is a roll 6 of foil 7. By rotating the head 3 the pig is set into rotation. Due to hook 8 the pig remains in position during the rotation. The leading edge of the foil is laid against the pig, adheres lightly thereto and owing to the rotating driving of the head 3 the pig is wrapped into the foil which is of a stretchable type, in this embodiment polyethylene. After the pig has been fully wrapped in at least one layer of foil 7 the strip of foil 7 is cut, for instance manually, and the pig 1 can be further transported to a cold store, the entrance swing doors of which are designated with 9.

Figure 2 shows an embodiment in which two rolls 6 of foil 7 are supported rotatably by a rotatably drivable frame 10. With this configuration symmetrical forces are exerted on the pig 1. In contrast to the embodiment of figure 1, a tendency of the pig 1 to start rotating must be prevented in this case. Use is therefore made of a hook 11 locked against rotation.

Figure 3 shows an embodiment in which two pigs are carried by rotatable hooks 8 which are suspended from a yoke 12. Use is made in this embodiment of rotatably drivable clamping members 13 with associated motors 14. In the manner shown in figure 3 a pig 1 suspended on the hook 8 can be clamped and rotated as according to arrow 15. Placed adjacent to the pigs 1 are foil delivery devices 16. These each comprise a motor 17 which drives a screw spindle 19 via a right-angle transmission 18. Not shown is that this screw spindle 19 is also rotatably mounted at the top. Co-acting with the screw spindle 19 is a carriage 20 that is locked against rotation and which carries a freely rotatable roll 6 of foil 7. Through driving of the motor 17 the carriage 20 can be moved upward in this embodiment according to arrow 21, whereby the foil 7 is carried along with the rotating pig 1 and is unwound from the roll 6 and, as a result of the upward directed displacement 21 of carriage 20, winds itself helically round the pig 1. A central control 22 ensures that the successive windings of the strip of foil 6 round the pig 8 have a desired value.

Figure 4 shows an embodiment in which two rolls 6 of foil 7 are disposed adjacent the path 5 of the pig 1. Also shown schematically are two sealing beams 24 which can be moved toward one another by undrawn means, as designated with arrows 25. The strips of foil 7 are mutually adhered by sealing with the leading edges of the strips. The relevant zone is designated with 26. Through further displacement of the pig 5 foil material 7 is carried along with the pig. By then moving the sealing beams 24 toward one another (see also figure 5) the foil strips 7 are laid against one another and the sealing operation can take place. The leading edges 27 of the sealing beams 24 are heated by heating means (not shown) so that the foil strips 7 can fuse together. This welding zone can be cut halfway along the zone by a cutting member 28. Thus achieved is that the two foil portions 7 are mutually adhered liquid-tight round the pig, while the apparatus is ready to wrap the following pig.

Claims

1. Method for preserving a piece of meat, for instance for transport, comprising the steps of:
   (1) slaughtering an animal;
   (2) optionally dividing said animal into two or more parts immediately thereafter;
   (3) providing a strip of moisture-tight, stretchable foil; and
   (4) tightly wrapping the slaughtered animal or the relevant parts thereof with the foil immediately thereafter such that the foil encloses the animal or the parts in substantially moisture-tight manner.

2. Method as claimed in claim 1, comprising the step of
   (5) performing step (4) such that the foil extends in one layer with overlapping edge zones.

3. Method as claimed in claim 2, comprising the step of
   (6) performing step (5) such that the foil

extends in helical manner.

4. Method as claimed in claim 1, comprising the step of

(7) performing step (3) such that a polyethylene (PE) foil is used.

5. Method as claimed in claim 4, comprising the step of

(8) performing step (7) with a foil of a thickness in the order of magnitude of 15 μm.

6. Method as claimed in claim 1, comprising the step of

(9) performing step (3) with a shrink foil that shrinks at a temperature which during wrapping lies just below the temperature of the slaughtered animal or the relevant parts.

7. Apparatus for performing the method as claimed in claim 1, comprising:

means for positioning a slaughtered animal or at least one relevant part thereof;

supply means for feeding a strip of moisture-tight, stretchable foil; and

wrapping means for wrapping an animal or the or each part with that foil.

8. Apparatus as claimed in claim 7, which apparatus comprises two or more foil delivery devices which are rotatable about a common axis round a positioned animal or part and which are positioned at substantially equal mutual angular distances.

9. Apparatus as claimed in claim 7, wherein the supply means wrap the foil in helical manner round the animal or the part.

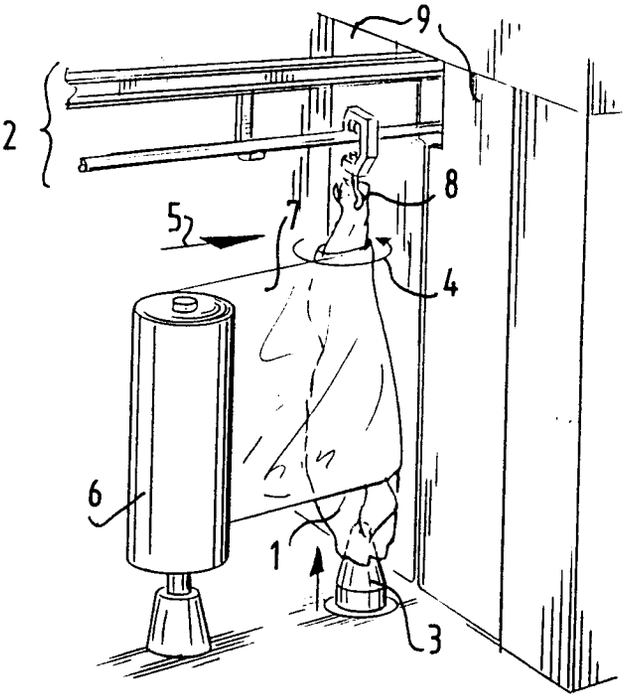


FIG.1

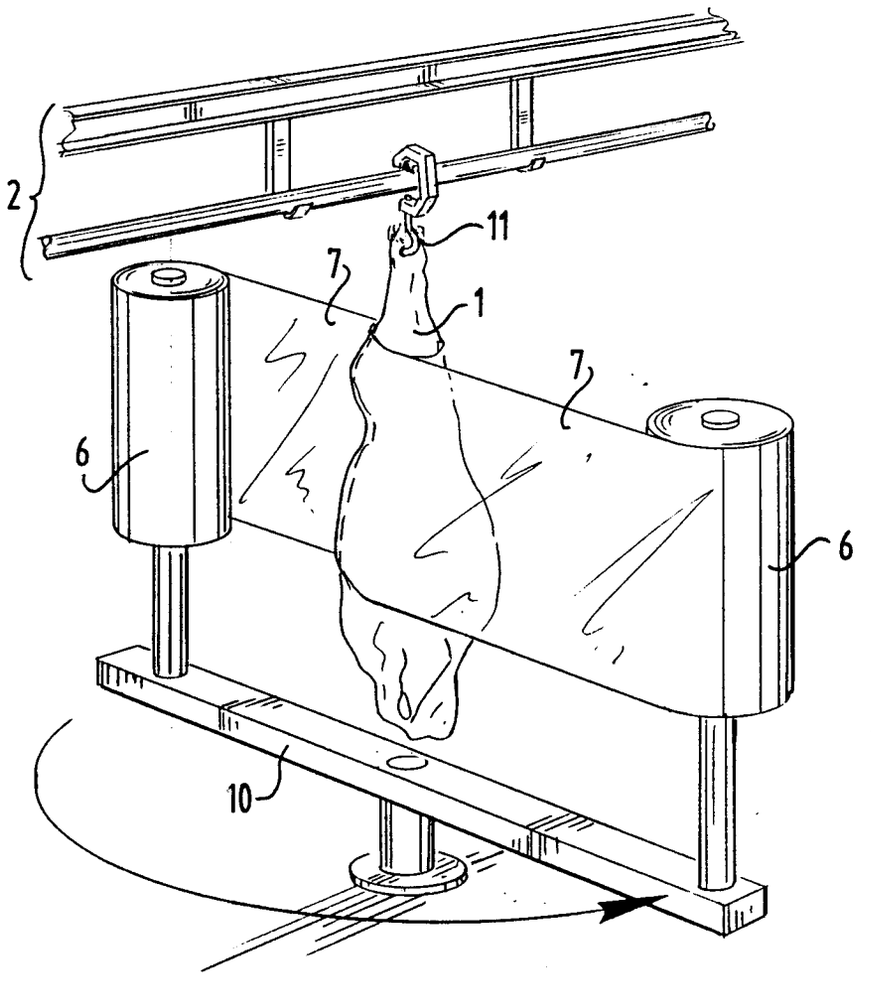
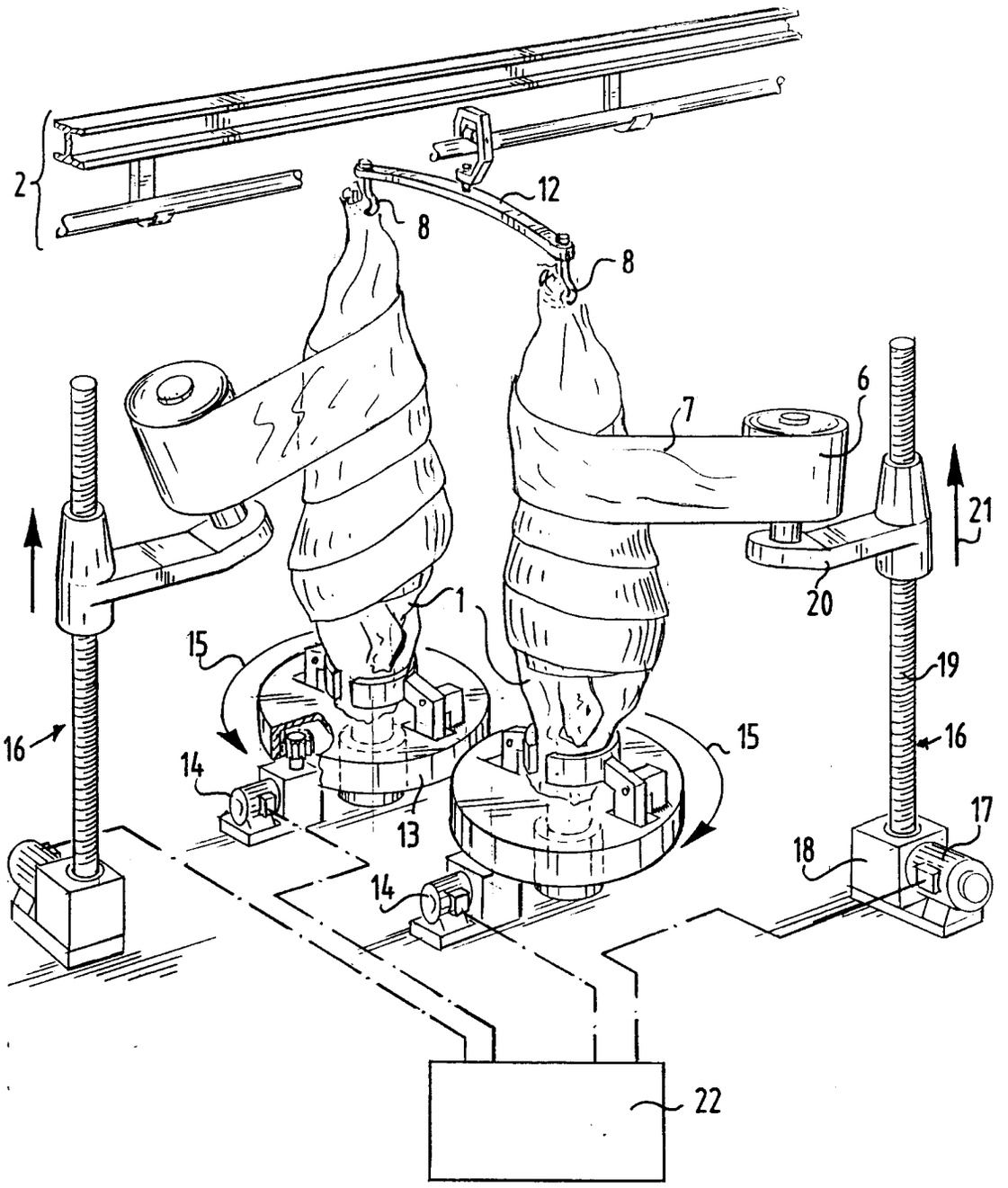


FIG.2



FIG,3

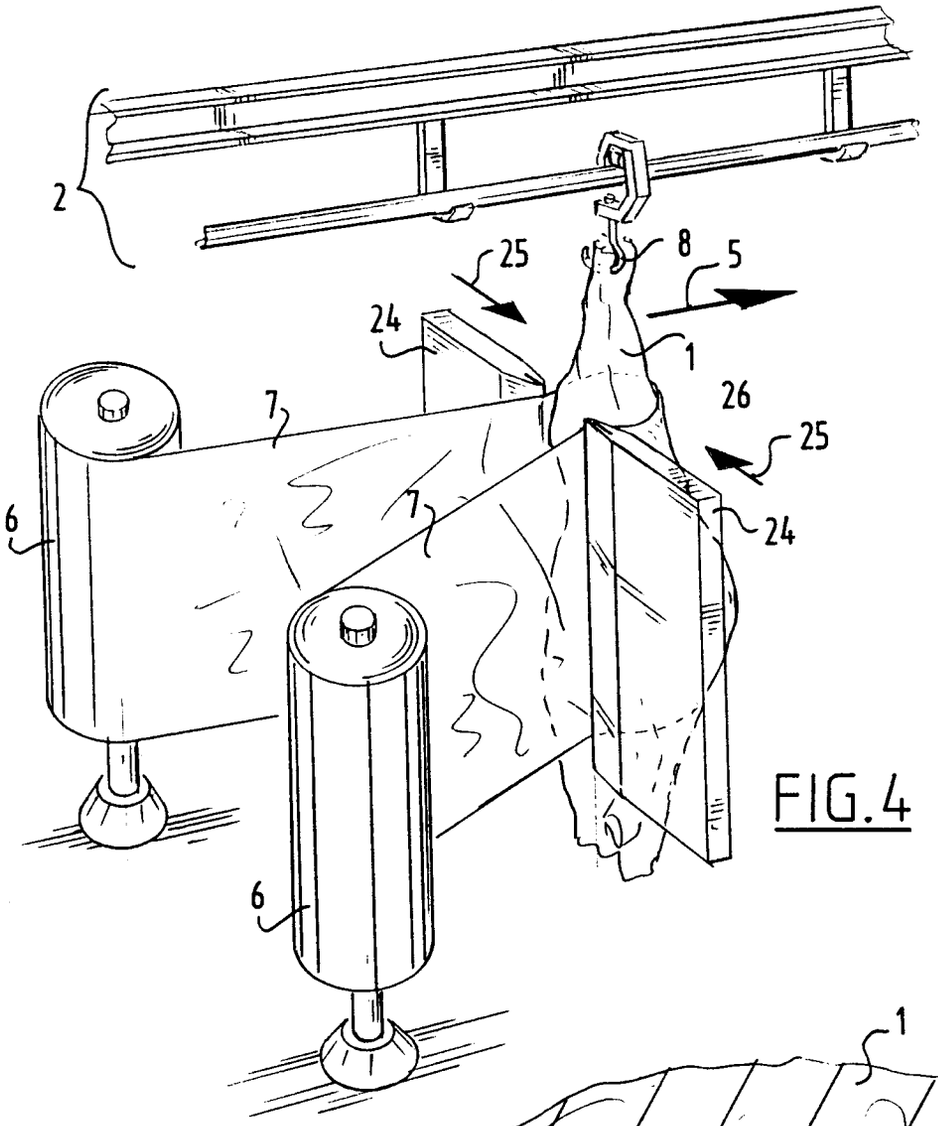


FIG.4

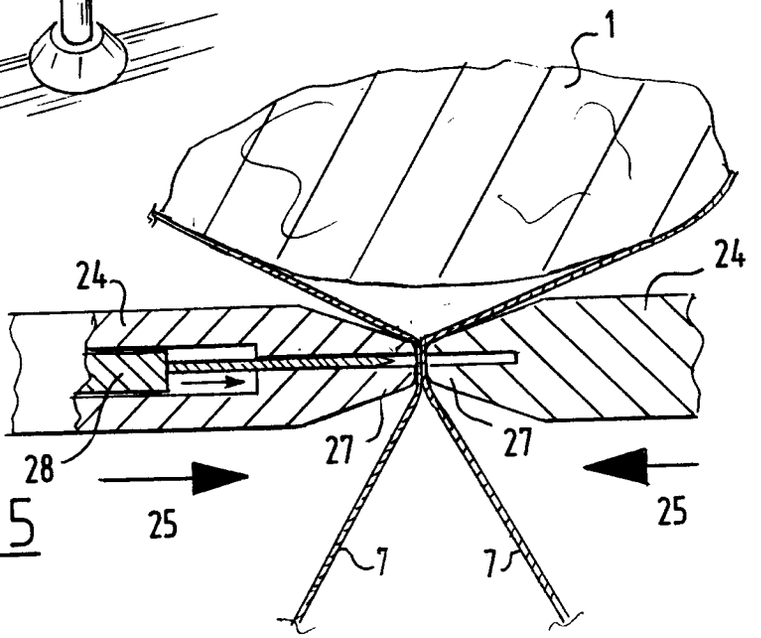


FIG.5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 20 3230

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 Y A	FR-A-2 109 926 (BORDEN) * the whole document * ---	1-3,7,9 4,5,8 6	B65B25/06
Y	FR-A-2 470 055 (EMCO) * page 3, line 27 - page 4, line 6 * ---	4,5	
Y	EP-A-0 156 012 (SCHENKE) * page 3, line 6 - line 21; figures 4,5 * -----	8	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17 JULY 1992	CLAEYS H.C.M.

CATEGORY OF CITED DOCUMENTS

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