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(54) Thermally insulating plastic carrier bag

(57) Thermally insulating plastic carrier bag, comprising: two flexible walls (23) manufactured from plastic, wherein a thermal insulation layer is fixed to the inner side of each of the walls, wherein the thermal insulation layer comprises a flat sheet and a sheet (9) arranged in corrugated manner thereon.

The combination of a flat sheet and a sheet arranged in corrugated manner thereon is also found to result in a good thermal insulation.

It is possible to supply both sheets on rolls, stacks or in other manner without the inclusion of air. The addition of the insulating air layer, which has a volume-increasing effect, only takes place during the manufacture of the insulating layer.

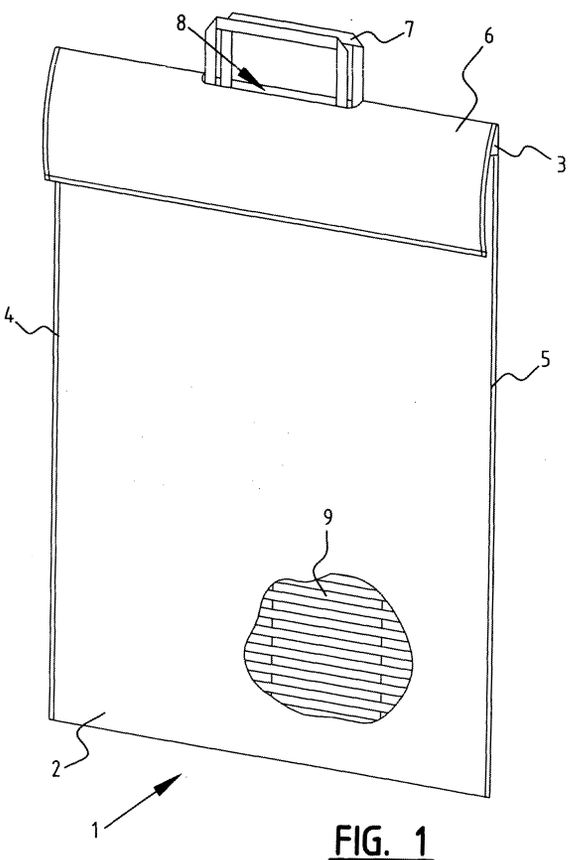


FIG. 1

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Description

[0001] The present invention relates to a thermally insulating plastic carrier bag, comprising two flexible walls manufactured from plastic, wherein a thermal insulation layer is fixed to the inner side of each of the walls.

[0002] Such carrier bags are generally known in the form of carrier bags available for instance in supermarkets for transporting deep-frozen foods. The thermal insulation layer is herein formed by a thin layer of plastic foam, optionally accompanied by a metal foil or a metallic layer vapour-deposited onto a plastic layer.

[0003] Such thermal carrier bags are expensive as a result of the rather high cost of the plastic foam layer. The plastic foam layer is moreover voluminous; it takes up a lot of space during transport, storage and processing.

[0004] The object of the present invention is to provide a thermally insulating plastic carrier bag, which can be manufactured at low cost and the raw materials of which take up less space during storage and transport.

[0005] This object is achieved in that the thermal insulation layer comprises a flat sheet and a sheet arranged in corrugated manner thereon.

[0006] The combination of a flat sheet and a sheet arranged in corrugated manner thereon is likewise found to result in a good thermal insulation.

[0007] It is possible to supply both sheets on rolls, stacks or in other manner without the inclusion of air. The addition of the insulating air layer, which has a volume-increasing effect, only takes place during the manufacture of the insulating layer.

[0008] Techniques are used for this purpose which greatly resemble the techniques used to manufacture carrier bags. Once production facilities for carrier bags are available, little extra investment is therefore required to expand these into production facilities for the insulating layer. Transport and storage of voluminous insulating material is herein obviated.

[0009] In order to enhance the insulating action, the carrier bag is preferably provided with a cover flap connected to one of the side walls.

[0010] The cover flap can hang loosely, but can also be connected to the side walls.

[0011] The use of a rigid bracket heretofore applied in thermally insulating plastic carrier bags can hereby be avoided. This reduces the cost-price.

[0012] Another preferred embodiment teaches that the carrier bag is provided with carrying handles fastened to the inner side of the walls and extending through the flap. It is also possible to make use of a handgrip punched out of the outer walls. This measure also results in a reduction of the cost-price.

[0013] Although the invention is intended in the first instance for plastic carrier bags, it is likewise possible to apply the insulation layer according to the invention for other purposes. The invention therefore also relates to an insulation layer comprising a flat plastic sheet and a sheet arranged in corrugated manner thereon, which layer is characterized in that the sheets are only attached to each other along lines extending transversely of the longitudinal direction of the corrugations.

[0014] The invention also relates to a method of manufacturing an insulation layer formed by a flat sheet and a sheet arranged in corrugated manner thereon, comprising the following steps of: placing a first sheet on a corrugated carrier in contact with the contour of the corrugated carrier, attaching a second sheet to the first sheet placed on the corrugated carrier and removing from the carrier the thus obtained combination of the second sheet and the first sheet.

[0015] This is found to be a particularly attractive method of manufacturing such material. Use is preferably made for this purpose of a device for manufacturing an insulating layer, which layer is formed by a flat sheet and a sheet arranged in corrugated manner thereon, which device is characterized by a carrier with a corrugated surface, a vacuum pump which is connected to openings arranged in the valleys of the corrugated surface of the carrier, supply means for supplying a first sheet to the carrier, supply means for supplying a second sheet to the carrier, and attaching means for attaching the first and the second sheet to each other.

[0016] Another preferred embodiment teaches that the attaching device is adapted to arrange attachment seams extending transversely of the length direction of the corrugations.

[0017] The present invention provides to this end a device which is characterized in that the carrier is substantially cylindrical and that the attaching device comprises a number of divided discs for pressing the second sheet onto the first sheet.

[0018] Other attractive preferred embodiments are stated in the remaining sub-claims.

[0019] The present invention will be elucidated hereinbelow with reference to the annexed drawings, in which:

Figure 1 shows a partly broken-away perspective view of a thermally insulating carrier bag according to the invention;
Figure 2 is a schematic perspective view of a device for manufacturing an insulating layer as is applied in the carrier bag shown in figure 1;
Figure 3 is a perspective view of a piece of the insulating material according to the invention; and
Figure 4 is a schematic detail view of the device shown in figure 3.

[0020] Figure 1 shows a thermally insulating carrier bag designated as a whole with 1. This thermally insulating carrier bag is manufactured from a front wall 2 and a rear wall 3 which are formed from the same strip of material. This strip of material is folded over on the underside, wherein the edges 4, 5 are connected to each other.

[0021] The rear wall 3 connects to a flap 6, which is folded over front wall 2. Although not shown in the drawing, it is also possible to attach the side wall of flap 6 to the edges 4, 5 so that a better closure is achieved.

[0022] Arranged on the top are two carrying handles 7 which extend through an opening 8 arranged in the flap 6. With the exception of the flap 6, the carrier bag described thus far corresponds with carrier bags generally known in the prior art.

[0023] The present carrier bag is substantially distinguished from prior art carrier bags by the fact that on the inner side of walls 2, 3 there is arranged an insulating layer which is formed by a corrugated material.

[0024] The quality of the corrugated material is shown in figure 2. The corrugated material, a sheet 9 of which is shown in figure 2, is formed by a flat sheet 10 and a sheet 11 arranged thereon in a corrugated pattern.

[0025] The sheets are connected to each other along a seam 12 which extends transversely of the longitudinal direction of the corrugations 11 and which is visible in figure 2 as a channel.

[0026] The thus obtained insulating material is manufactured from two flat sheets, wherein the air between the corrugated sheet and the flat sheet is added only at the moment the two sheets are attached to each other. This means that the large volume is obtained only then.

[0027] The corrugated material shown in figure 2 is applied as insulating material in the bag shown in figure 1. Although it is possible in principle to arrange the insulating material on the outside, it is recommended from considerations of production engineering to arrange the insulating material on the inside. The outside is then after all wholly flat without deformations caused by the attaching process. The outside has, as will be apparent when it is for instance printed, a smooth exterior.

[0028] It is likewise recommended that the corrugated material is only connected to the front wall or the rear wall at the edges. It is of course possible to attach the corrugated material over the whole surface on front or rear wall, but this results in a more complicated production process.

[0029] For the manufacture of the corrugated material a device is applied as shown in figure 3.

[0030] Figure 3 shows a cylindrical rotatable roller 15 which, as shown in detail in figure 4, is provided with notches 16 extending in axial direction along the periphery. In the bottom of notches 16 are arranged air holes 17 which are connected to a vacuum pump not shown in the drawing.

[0031] A pressure roller 18 is arranged with its axis parallel to the axis of cylindrical roller 15, wherein the surface of pressure roller 18 is in contact with the surface of cylindrical roller 15. A shaft 19 is also arranged parallel to the axis of cylindrical roller 15, wherein discs 20 are placed on shaft 19 at regular mutual distances. The discs 20 are provided with a heating device.

[0032] The device is further provided with a number of guide rollers 21-28.

[0033] The operation of this device will now be described.

[0034] From a supply roll not shown in the drawing a first sheet 29 is guided along guide roller 23 and the set of guide rollers 24, 25 and 26 onto the surface of cylindrical roller 15. As a result of the suction effect of the air holes 17 connected to a vacuum pump, the sheet 29 will be pulled into the channels 16 of roller 15.

[0035] A second sheet 30 is trained via guide rollers 21 and 22 onto the surface of roller 15, and onto the first sheet 29 present thereon. The pressure roller 18 here ensures that the second sheet is pressed onto the first sheet 29.

[0036] As roller 15 rotates further, the combination of the first sheet 29 and the second sheet 30 passes over the array of heated discs 20 which provide an attachment of the two sheets 29, 30 to each other, wherein the corrugated form is fixed by the attachment.

[0037] Use is made here of the situation that at least one of the sheets, preferably the second sheet, is manufactured from thermoplastic material. It is also possible in principle to make use of other types of attaching means, for instance by adding a glue or a solvent between the two sheets. The above discussed device results in an attachment only at those locations on the surface of the sheets which are heated by discs 20. The connecting seams 12 are hereby created in the corrugated material.

[0038] It is in principle possible to make use of other configurations, for instance a heating or attaching roller extending over the whole surface of the cylindrical roller 15. A stronger attachment is hereby achieved, although the energy use hereof is considerably greater.

[0039] Use could then be made of the pressure roller 18 to perform the heating or attaching function.

[0040] As already mentioned initially, the thus obtained corrugated material is used as internal thermal insulation of carrier bags. It is however possible to also use the thus obtained material for other purposes, for example as sheets of packing material, wherein the sheets also have an insulating effect. It is possible here to envisage a use as replacement for the material known as bubble wrap.

[0041] A great advantage of the present invention lies in the logistical utility; used as raw materials are the same flat plastic sheets which take up little space, while it is possible to obtain insulating material by making use of the machines of the same type as are used to manufacture carrier bags. The problem of transporting and storing voluminous insulating material is avoided by manufacturing the insulating material at the same location as where the insulating material is used to manufacture carrier bags.

Claims

1. Thermally insulating plastic carrier bag, comprising:

two flexible walls manufactured from plastic, wherein a thermal insulation layer is fixed to the inner side of each of the walls, **characterized in that** the thermal insulation layer comprises a flat sheet and a sheet arranged in corrugated manner thereon.

2. Carrier bag as claimed in claim 1, **characterized in that** the thermal insulation layer is manufactured from plastic.

3. Carrier bag as claimed in claim 2, **characterized in that** the thermal insulation layer is placed with its flat sheet toward the inside of the carrier bag.

4. Carrier bag as claimed in claim 3, **characterized in that** the thermal insulation layer is connected to the walls of the carrier bag only on the upper edge and the side edges of the carrier bag.

5. Carrier bag as claimed in any of the foregoing claims, **characterized in that** the carrier bag is provided with a cover flap connected to one of the side walls.

6. Carrier bag as claimed in claim 5, **characterized in that** the carrier bag is provided with carrying handles fastened to the inner side of the walls and extending through the flap.

7. Insulation layer, comprising: a flat plastic sheet and a sheet arranged in corrugated manner thereon, **characterized in that** the sheets are only attached to each other on lines extending transversely of the longitudinal direction of the corrugations.

8. Method of manufacturing an insulation layer formed by a flat sheet and a sheet arranged in corrugated manner thereon, comprising the following steps of:

- placing a first sheet on a corrugated carrier in contact with the contour of the corrugated carrier;
- attaching a second sheet to the first sheet placed on the corrugated carrier; and
- removing from the carrier the thus obtained combination of the second sheet and the first sheet.

9. Method as claimed in claim 8, **characterized in that** the first sheet is placed in contact with the contour of the carrier through openings which are arranged in the carrier and connected to a vacuum pump.

10. Method as claimed in claim 8 or 9, **characterized in that** the corrugated layer is attached to the flat sheet only at locations extending transversely of the corrugation direction.

11. Method as claimed in claim 10, **characterized in that** the first sheet is placed in a continuous operation on a round carrier.

12. Device for manufacturing an insulating layer formed by a flat sheet and a sheet arranged in corrugated manner thereon, **characterized by**:

a carrier with a corrugated surface;
a vacuum pump which is connected to openings arranged in the valleys of the corrugated surface of the carrier;
supply means for supplying a first sheet to the carrier;
supply means for supplying a second sheet to the carrier; and
attaching means for attaching the first and the second sheet to each other.

13. Device as claimed in claim 12, **characterized in that** the attaching device is adapted to arrange attachment seams extending transversely of the longitudinal direction of the corrugations.

14. Device as claimed in claim 13, **characterized in that** the carrier is substantially cylindrical and that the attaching device comprises a number of discs extending over the width of the carrier for pressing the second sheet onto the first sheet.

15. Device as claimed in claim 14, **characterized in that** at least one of the sheets is thermoplastic and that the discs are heated.

16. Method of manufacturing a carrier bag as claimed in any of the claims 1-6, **characterized by** a method as claimed in any of the claims 8-11 and, without transporting the thus obtained product over any substantial distance, subsequently manufacturing the carrier bags.

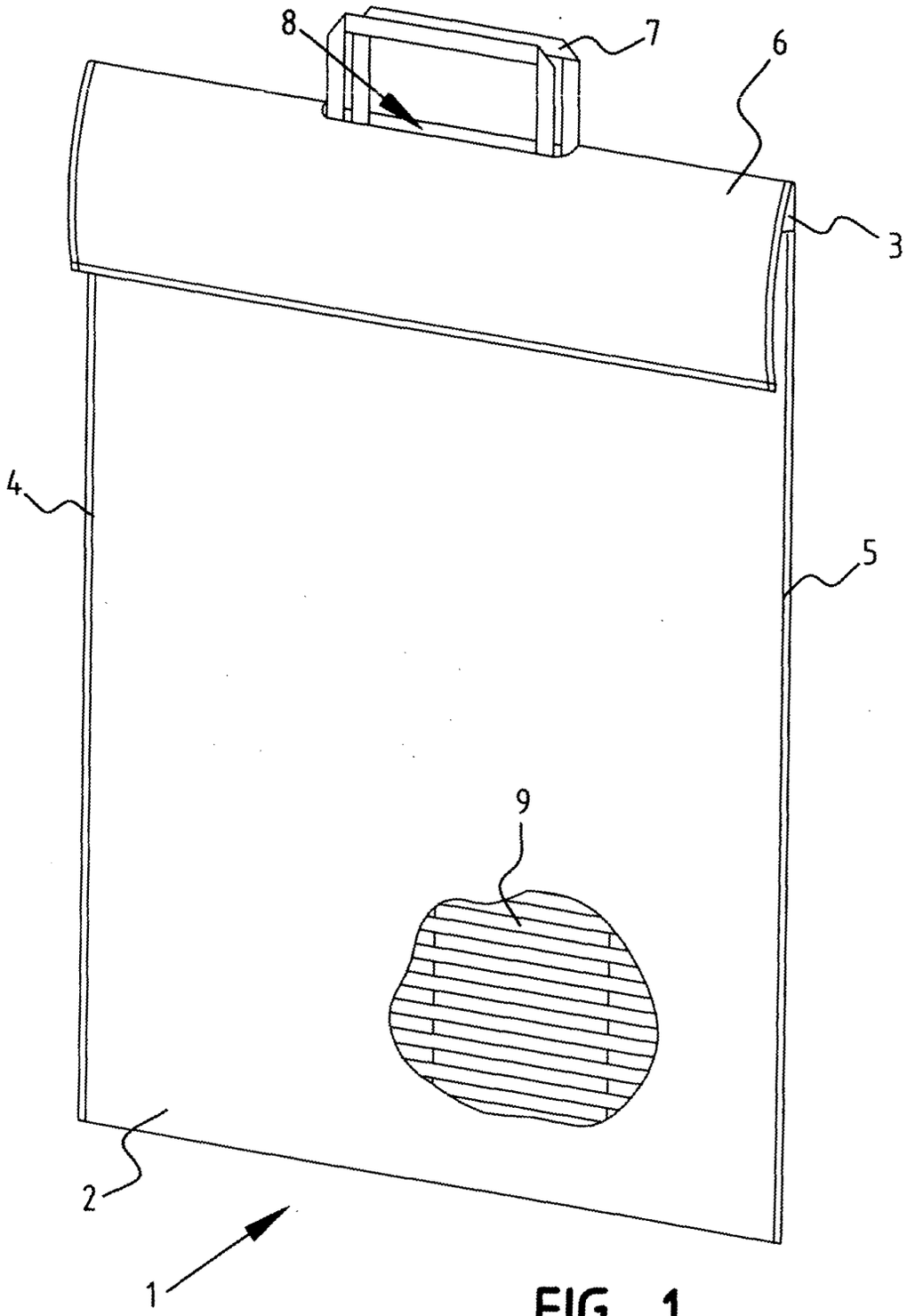


FIG. 1

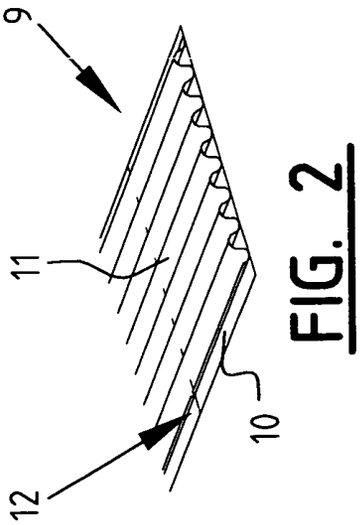


FIG. 2

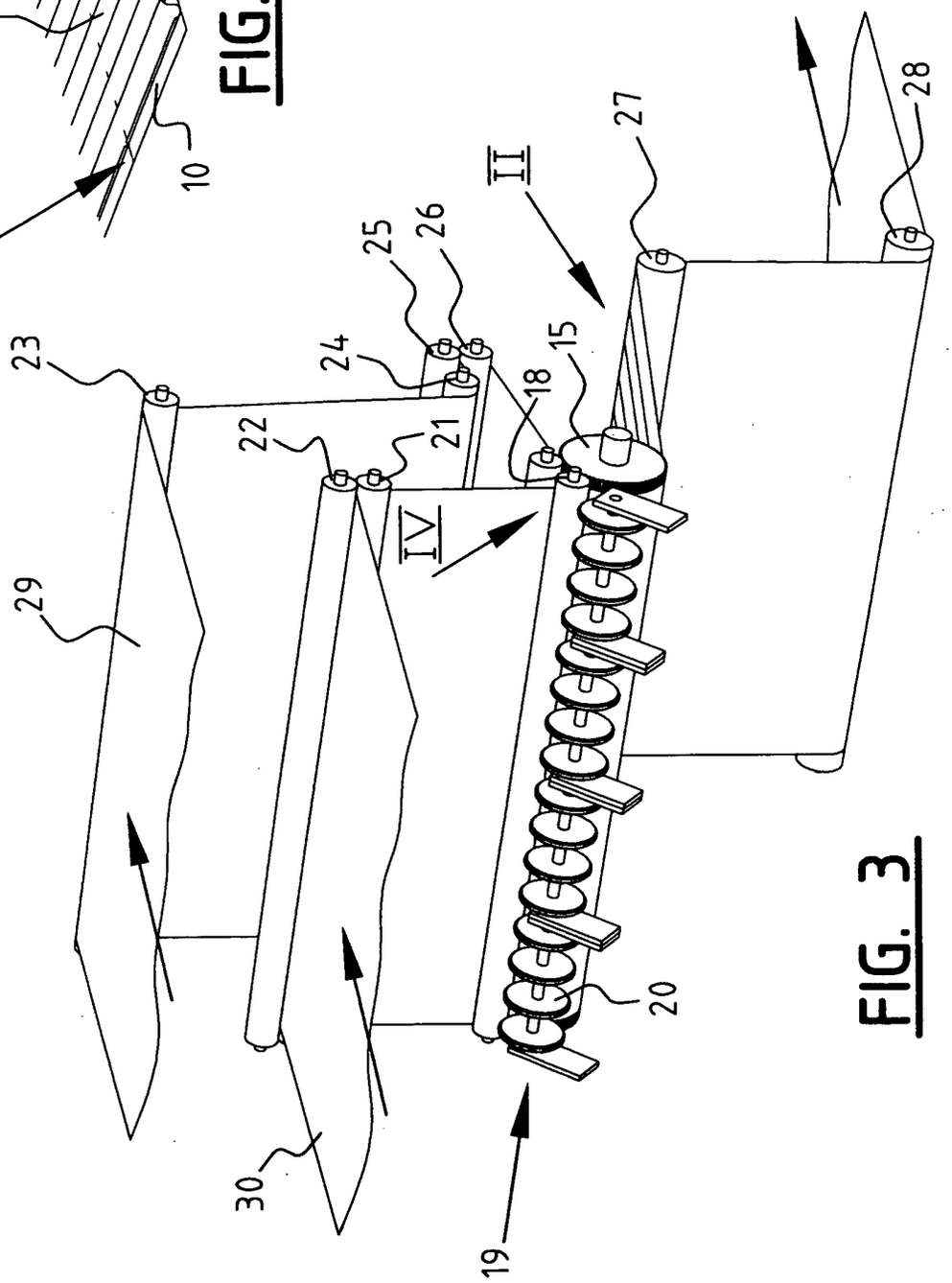


FIG. 3

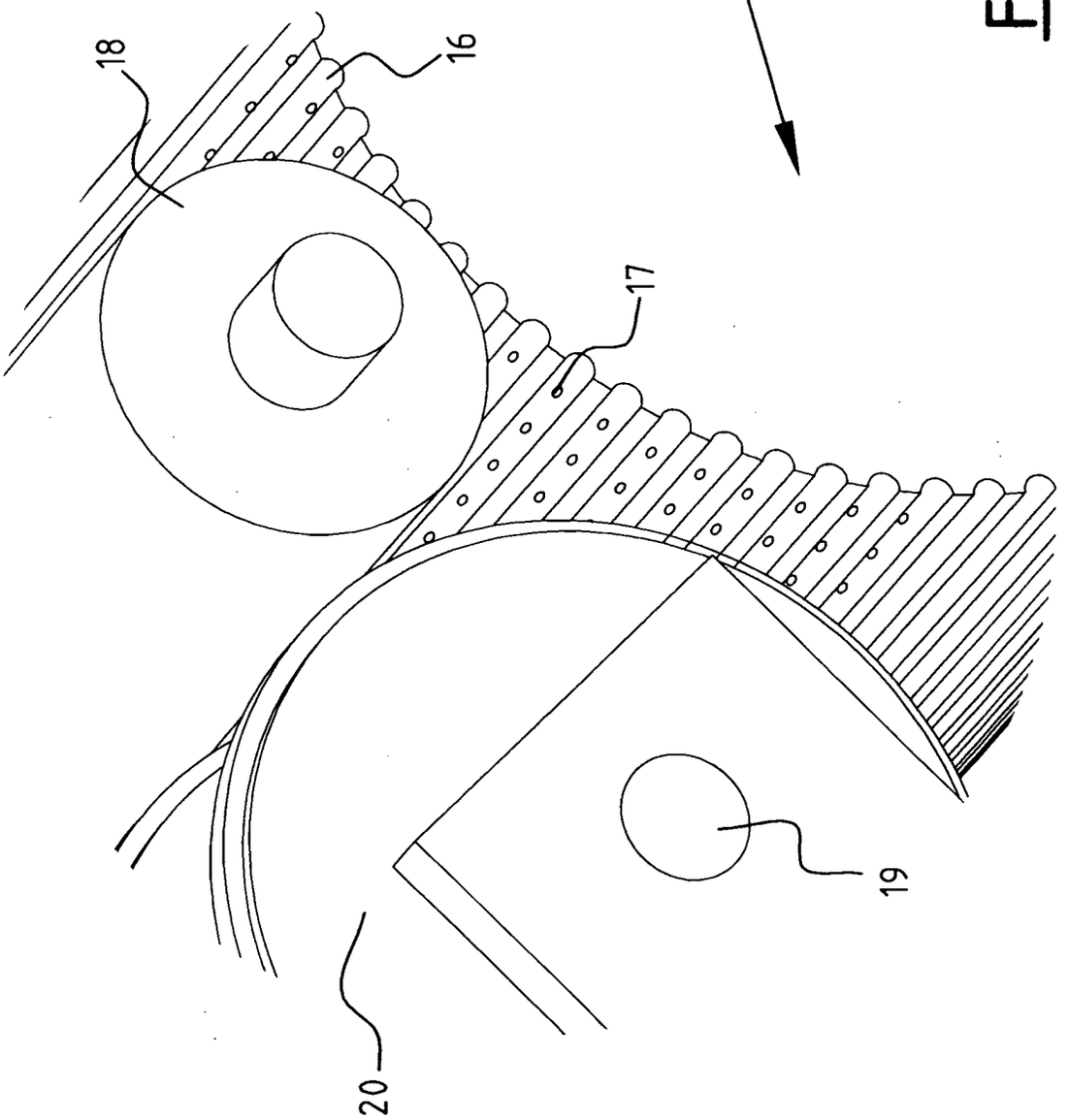


FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 03 07 7212

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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	10 October 2003	SERRANO GALARRAGA, J

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