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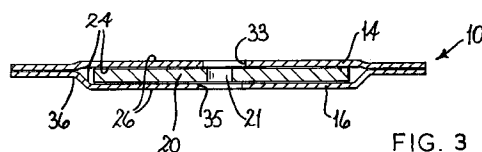
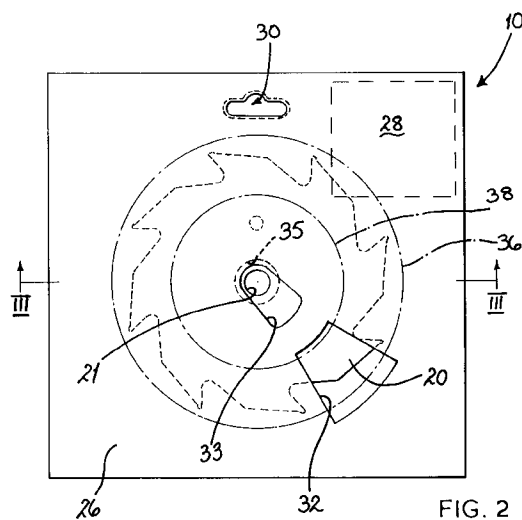
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(54) **Sales package for circular saw blade.**

(57) A circular saw blade (20) is packaged (10) between two sheets of cardboard (14, 16) adhered close around the blade. The blade is centralised in the package by a pin (58) on a die (46) passing through an eye (35) on one side (16) of the package.



This invention relates to packaging for disc-like objects of dense material such as circular saw blades.

Packaging of such objects, particularly saw blades and other discs having sharp edges pose particular packaging problems. This is because the disc must not be allowed freedom of movement inside a package which is to any degree larger than the disc. The reason for this is twofold; firstly, if any movement takes place during transportation or handling, the disc will collide with the edges of the packaging. In the case of saw blades, the teeth on the blade may well puncture the packaging and protrude through, if it does not actually burst through the packaging altogether. Secondly, some carbide tipped blades are easily blunted by such sliding movement. So the packaging must be fitted to the size of the disc, which is expensive because each size of disc must have its own specific packaging.

Blister packs are commonly employed nowadays and these come essentially in two types. The semi-rigid bubble pack really does not overcome the aforementioned disadvantages and, on the whole, the bubble must fit the blade. The flexible heat shrunk pack is more adaptable in that it closely smothers the blade to prevent any movement and its size is to some extent a side issue. However, numerous other problems exist with these packs.

First and foremost, the blisters are made of plastic and are strongly adhered to a cardboard backing sheet. This adhesion is a point of weakness of the packaging and it is a measure of the suitability of the pack that when it is opened, either the plastic tears, leaving some still adhered to the cardboard, or else the very fabric of the cardboard tears, leaving cardboard adhered to the plastic. In either event, recycling this type of packaging is a nightmare and despite its usefulness and widespread use, this method is not satisfactory from an environmental point of view, particularly given recent environmental legislation in Germany.

But in the packaging of circular saw blades, it poses other problems as well. Circular saw blades are relatively big and the packaging should not be much bigger than the diameter of the blade if it is not to appear unbalanced and overpackaged. Consequently, the available room on the front of the card that backs the package is limited for the insertion of product information. This is particularly the case where the same backing is used for several sizes of blade where space must be left for the largest size blade. Some of this problem is overcome by printing information on the blade itself.

A further problem with this type of packaging is that it is intended for hanging on store hanging elements and so is provided with hanging slots. Compared with the weight of a saw blade, the packaging is negligible and so to ensure that the packaging hangs squarely in its frame, the hanging slot must be

immediately above the centre of the blade. This poses further limitations on the versatility of the packaging, bearing in mind that it is desirable, given the above considerations, to place the blade to one side of the packaging to give room on the other side for product information.

It is therefore an object of the present invention to address these problems and, if not to solve them, then at least to mitigate their effects.

In accordance with this invention there is provided a disc package comprising first and second cardboard sheets each having an adhesive layer on one side, a disc sandwiched between said sheets, said adhesive layers facing each other and adhering the two cardboard sheets together about the periphery of said disc to form a package and substantially to prevent significant movement of the disc within the package.

The disc may be a circular saw blade having a central hole.

Preferably the sheets are formed from a single folded sheet.

The second sheet may have an aperture through which a spigot may be passed to locate in the hole in the saw blade and by means of which the blade is positioned centrally with respect to the package.

The first sheet may have an aperture in the region of the edge of the disc through which the disc can be viewed and touched.

The first sheet may have a further aperture opposite that in the second sheet, which, if it is larger than the hole in the blade, enables a customer to check for himself that the blade has the correct central hole for his/her purpose.

The adhesive is preferably heat activated and water soluble.

The invention also provides a method of forming a disc package comprising the steps of:-

- a) providing first and second cardboard sheets, each provided with an adhesive layer on one side;
- b) forming a sandwich of said sheets and a disc disposed between them, said adhesive layers facing each other; and,
- c) adhering said layers together around the periphery of the disc so that the disc has substantially no freedom of movement in said package.

Preferably said adhesive is heat activated in which event, said method may further comprise the steps of:-

- d) curing said adhesive layers in a jig comprising a heated platen of area larger than said sheets and a mould having a circular aperture of diameter slightly larger than said disc; and,
- e) pressing said platen against said mould with said sandwich positioned therebetween.

Preferably said disc has a central hole, said second sheet has an aperture and said mould is mounted

on a base having a spring-loaded spigot and said method further comprises the steps of:-

- f) placing said second sheet on said mould so that said spigot passes through said aperture; and,
- g) supporting said disc on the spigot in said hole in the disc to centralise said disc with respect to the package.

The present invention therefore provides a packaging in which there is no admixture of plastics and paper material. The adhesive is ideally water soluble so that the packaging is rendered environmentally as sound as possible.

The packaging can be used for a variety of different sizes of saw blade without difficulty. The disc is always central in the package so that the hanging slot can likewise be central and is not dependent on which disc is being packaged.

The method of forming the package results in adhesion of the sheets around the disc and close to it, so that it cannot move inside the package and hence is unlikely to damage the package during normal transportation and handling. Different moulds are used for different size discs so that the adhesion is close to the edges of the disc. Similarly, the spigot is sized to fit particular discs.

The invention is further described hereinafter, by way of example only, with reference to the accompanying drawings, in which:-

Figure 1 is a plan view of a blank packaging sheet according to the present invention with a saw blade in position;

Figure 2 is a closed packaging according to the invention; Figure 3 is a section on the line III-III in Figure 2;

Figures 4a and b are side views, partly in section showing the adhesion process.

In Figure 1 a sheet of cardboard 22 has a fold line 12 to form first and second sheets 14, 16 of a packaging 10 (see Figure 2) according to the present invention. The packaging 10 is for disc-like objects, specifically circular saw blades 20.

On one side 24 of the sheet 22, over its whole surface, there is coated by any convenient means a layer of water soluble adhesive of the type activated by moderate temperature. Such adhesives are commonly available and do not form part of the present invention.

On the other side 26 of the sheet 22, there is printed product branding and other information, making use of the whole area of both the front and back of the finished package.

One area, 28 can be left blank for subsequent overprinting of specific information relating to the particular blade 20 enclosed - that is to say, the size, number and type of teeth, the material it cuts etc.

At the top and bottom of the sheet 22 is punched a pair of hanging slot holes 30a, b which form a hanging slot 30 when the first and second sheets are fold-

ed against each other to form the package 10. It is to be noted that the front hole 30b in the first sheet 14 is smaller than the hole 30a so that, should there be any slight misalignment between the holes 30a, b, then the inside edge of the hole 30a would still not be visible from the front of the package.

An aperture 32 is punched in the first sheet 14 so that the saw blade 20 is visible through the packaging. Also, it can be touched and felt through this hole, which is an important sales tool, substantially denied in conventional packaging. One reason this can be permitted here is that, because the sheets 14, 16 are adhered together around the periphery 36 of the blade, it cannot move inside the packaging 10. Thus one small aperture 32 is not going to prejudice the security of the packaging to any great extent.

Another aperture 33 is formed in the first sheet 14 which coincides with the centre of the saw blade 20 and so that its central hole 21 is visible from the outside.

Finally, an aperture 35 is formed in the second sheet 16 for reasons explained further below.

The size of the sheet 22 is adapted to a range of sizes of saw blades 20, and it is found in practice that three sizes of sheet 22, each with its own capacity for packaging a (different) range of sizes of saw blades, is sufficient to cater for the entire range of the most commonly employed circular saw blades. Figure 2 shows the relative sizes of the largest (line 36) and smallest (line 38) of blades conveniently packaged by the package 10.

As mentioned above, the sheets 14, 16 are adhered together around the periphery 36 of the blade 20. This is achieved in a jig 40 shown in Figures 4a and b.

The jig 40 comprises a platen 42, mould 44 and base 46. The platen includes heating means (not shown) and is movable up and down, in the direction of the arrow A, by a ram 48. The mould 44 is a rubber disc having a cut-out 50 which is circular in plan view.

The mould 44 is adapted for each size of saw blade to be packaged in the package 10 by the size of the cut-out 50, whose diameter is slightly larger than the diameter of the blade. The mould can be secured to the base 46 by any convenient means, including such press-fit fastening arrangements as hooped and hooked nylon attached respectively to the mould 44 and base 46.

The package 10 is formed by coating with adhesive and punching out the blank sheet 22. The blade 20 is then placed on the second, rear sheet 16 and the first front sheet 14 is folded over along the line 12 to cover the second sheet and blade.

The base 46 is wooden and has a central bore 52 receiving a spring 54 and spigot 56. The spigot 56 has a head 58 which is of a diameter to fit the hole 21 of the blade 20. The spigot head 58 enters the hole 21 after passing through the aperture 35 in the second

sheet 16. The sheets 14, 16 are conveniently centralized on the mould and base by pins or the like (not shown). Thus the spigot 56 serves to centralise the blade with respect to the packaging sheets 14, 16.

The platen 46 is lowered in the direction of arrow A and pressed against the mould 44, sandwiching the package 10 between them.

Pressure is applied, and the platen 46 is heated and this is held for sufficient time to activate and cure the adhesive in the coating on surface 24 around the periphery of the indentation 50. The pressure ensures penetration of the adhesive in the fabric of the cardboard sheets.

The blade 20 drops slightly into the cut-out 50 distorting, to a small extent, the second, rear sheet 16 around the blade 20. The spigot 56 is pushed into its receiving bore 52 in the base 46, compressing the spring 54. The front, first sheet 14 remains substantially flat. With one water soluble adhesive presently available on the market, a secure package with good adhesion around the blade was obtained using moderate pressure on the platen 46 at a temperature of 160°C, held for approximately four seconds before release.

Claims

1. Disc package (10) comprising first (14) and second (16) cardboard sheets each having an adhesive layer on one side (24), a disc (20) sandwiched between said sheets, said adhesive layers facing each other and adhering the two cardboard sheets together about the periphery of said disc to form a package and substantially to prevent significant movement of the disc within the package, said second sheets having an aperture (35) coincident with the hole in the disc. 30
2. A package as claimed in claim 1, characterised in that the disc is a circular saw blade having a central hole. 40
3. A package as claimed in claim 1 or 2, characterised in that the sheets are formed from a single folded sheet. 45
4. A package as claimed in any preceding claim characterised in that said aperture is larger than the hole in the disc through which aperture a spigot (58) is adapted to pass to locate in the hole in the disc and by means of which the blade is positioned centrally with respect to the package. 50
5. A package as claimed in any preceding claim, characterised in that the first sheet is a front sheet of the package and has an opening (32) in the region of the edge of the disc through which 55

the disc can be viewed and touched.

6. A package as claimed in any preceding claim characterised in that said first sheet has an aperture (33) opposite that in the second sheet. 5
7. A package as claimed in any preceding claim, characterised in that the adhesive is a heat activated adhesive. 10
8. A package as claimed in any preceding claim, characterised in that the adhesive is water soluble. 15
9. A package as claimed in any preceding claim, characterised in that the package has sides, and top and bottom edges and in which the disc is centralised in the package with respect to the sides of the package and is provided with a hanging slot (30) centrally between the sides near said top edge. 20
10. A package as claimed in claims 3 and 9, characterised in that the fold (12) forms said bottom edge. 25
11. A package as claimed in claim 9 or 10, characterised in that the hole (30b) in the first sheet forming said hanging slot is smaller than the hole (30b) in the second sheet. 30
12. A method of forming a disc package (10) comprising the steps of:- 35
 - a) providing first (14) and second (16) cardboard sheets, each having an adhesive layer on one side (24);
 - b) forming a sandwich of said sheets and a disc (20) disposed between them, said adhesive layers facing each other; and,
 - c) adhering said layers together around the periphery of the disc so that the disc has substantially no freedom of movement in said package.

characterised in that said method further comprises the steps of:-

 - d) curing said adhesive layers in a jig (42, 44, 46) comprising a heated platen (42) of area larger than said sheets and a mould (44) having a circular aperture (50) of diameter slightly larger than said disc; and,
 - e) pressing said platen against said mould with said sandwich positioned therebetween.
13. A method as claimed in claim 12, characterised in that said disc has a central hole (21), said second sheet has an aperture (35) and said mould is mounted on a base (46) having a spring-loaded spigot (56,58) and said method further compris-

es the steps of:-

f) placing said second sheet on said mould so that said spigot passes through said aperture; and,

g) supporting said disc on the spigot in said hole in the disc to centralise said disc with respect to the package. 5

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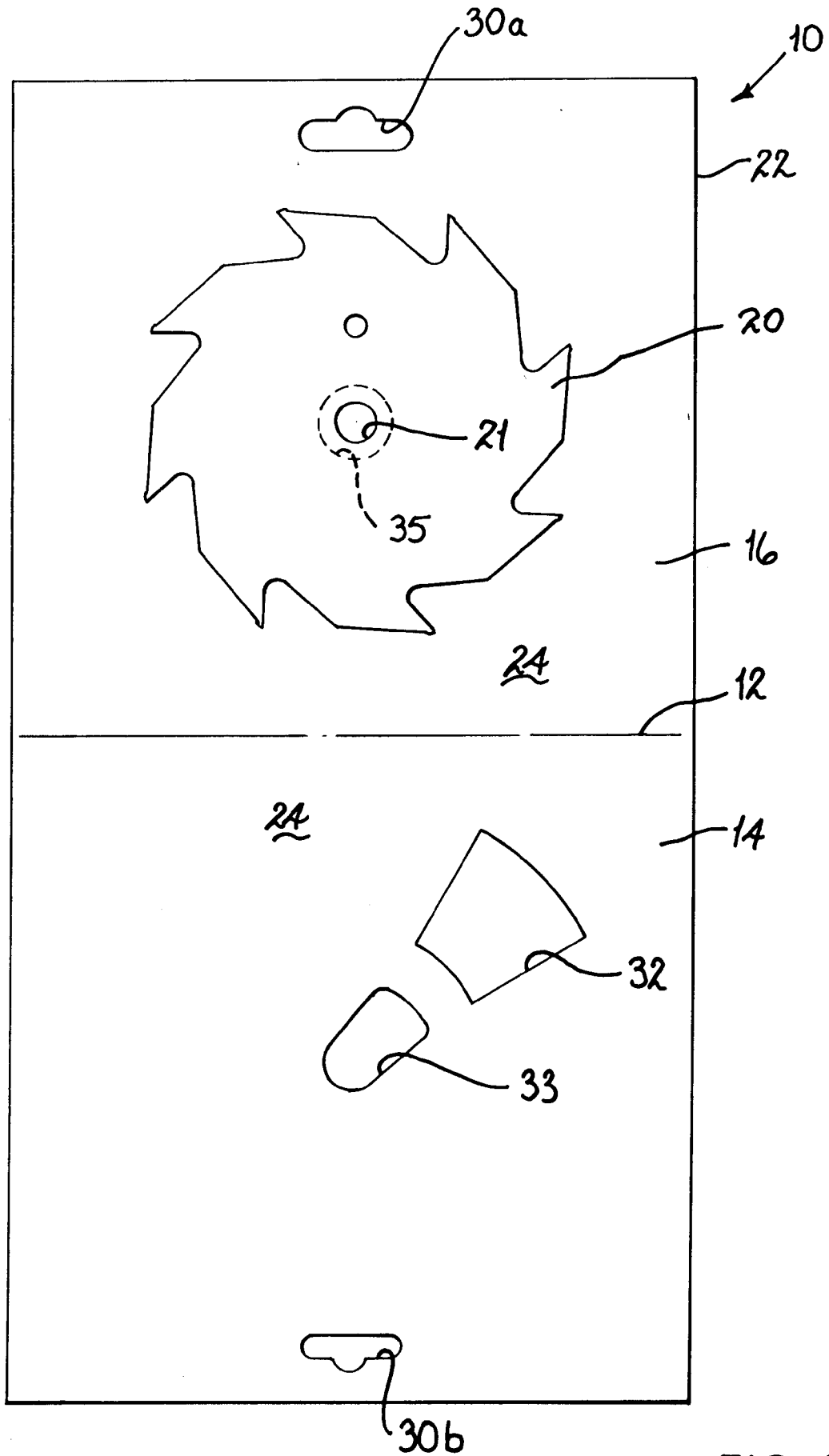
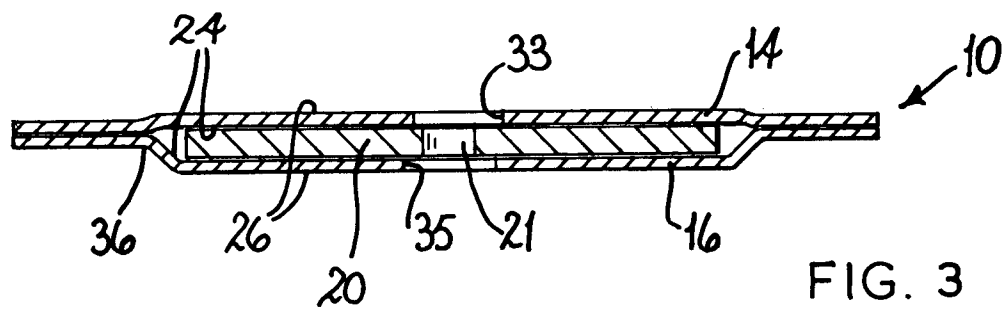
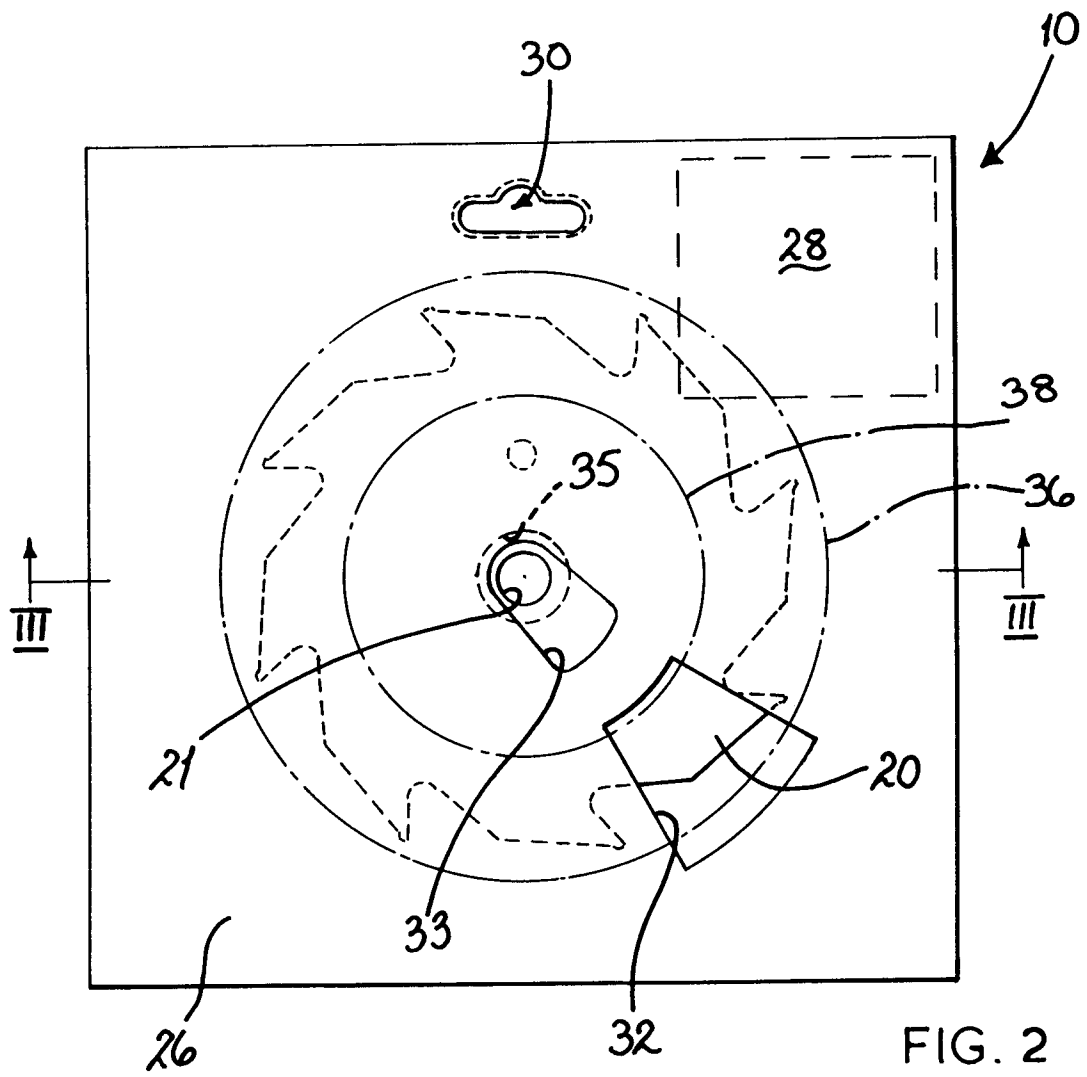


FIG. 1



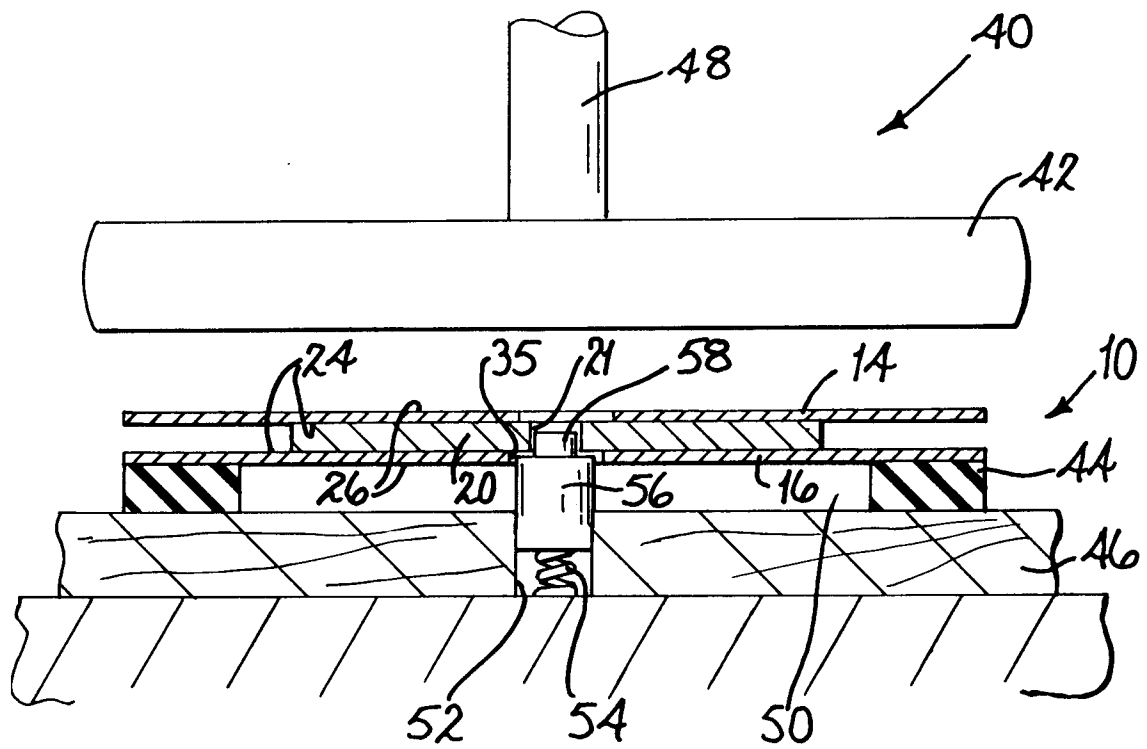


FIG. 4a

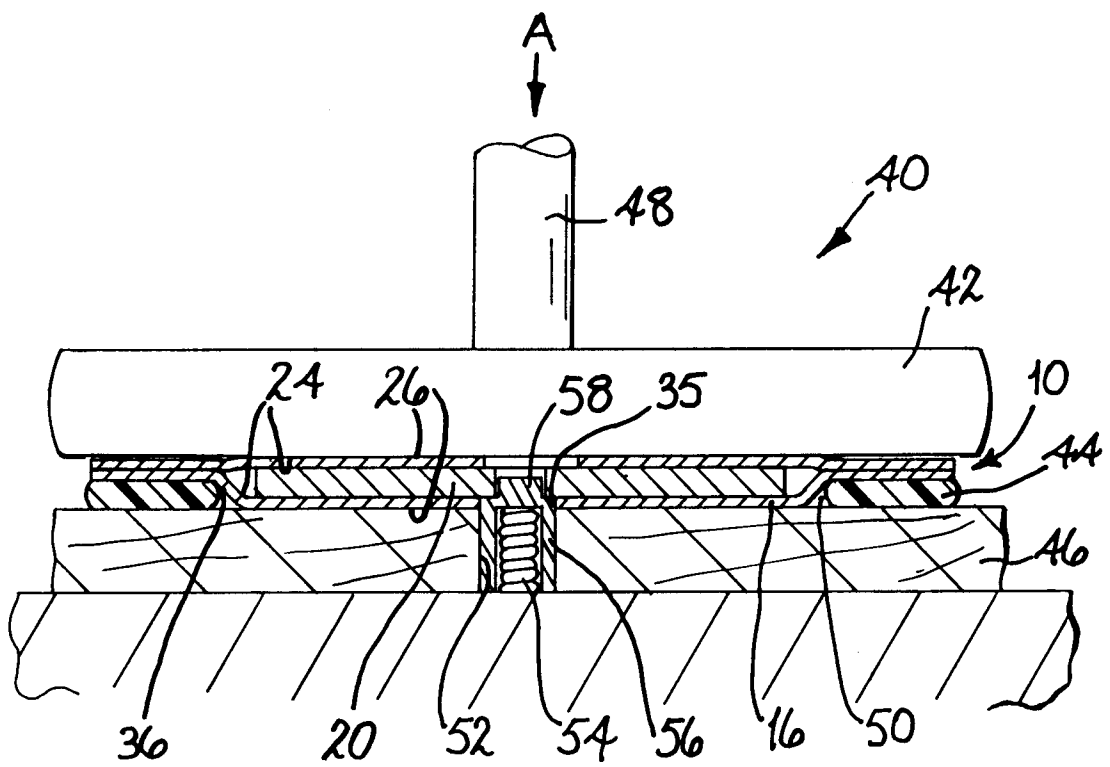


FIG. 4b



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 93 30 1601

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)
Y	DE-U-9 102 473 (WOLCRAFT ROBERT WOLF)	1,3,5,6,9,10	B65D73/00 B65D75/20
A	* page 4, line 6 - page 5, line 9; claims 1,6; figures *	2,8,12,13	
Y	GB-A-356 927 (FILMOPHONE)	1,3,5,6,9,10	
	* page 2, line 10 - page 2, line 55; figures *		
A	GB-A-2 233 308 (OSAKA SEALING)	1	
	* page 5, line 13 - page 9, line 5; figure 1 *		
A	US-A-4 095 691 (CLEMENS)	4,12,13	
	* column 2, line 4 - column 4, line 22; figures 1-9 *		
A	GB-A-731 782 (AMERICAN SAFETY RAZOR CORP.)	7,12,13	
	* page 2, line 15 - page 3, line 14; figures *		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15 JUNE 1993	Examiner NEWELL P.G.
CATEGORY OF CITED DOCUMENTS 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 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 & : member of the same patent family, corresponding document			

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