(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 644 520 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94114407.3**

(51) Int. Cl.[6]: **G09F 11/02**

(22) Date of filing: **14.09.94**

(30) Priority: **22.09.93 SE 9303080**

(43) Date of publication of application:
22.03.95 Bulletin 95/12

(84) Designated Contracting States:
AT BE DE ES FR GB IT NL PT

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(54) Method and device for the application of messages on a sign composed of rotatable prisms.

(57) The present invention relates to a method and a device for applying a removable message on a sign for consecutive repeated presentation of series of images and of the type wherein each image is made up of a plurality of image portions located on rotatable prisms or display screens having a cross section such as that of an equilateral triangle and wherein the same poster blades as for common billboards are used. The object of the invention is to permit an easier, safer and quicker replacement of messages. This is arrived at by providing each screen side (3) with a plastic foil (4) which covers said screen side and which is located at a small distance outside the screen side and by inserting from below into the space provided therebetween, the message in the form of a paper strip (28) by means of a rigid band (22) which from a coiled position on a tool located on a lower beam (1) of the sign is brought to enter between the screen-side and the plastic foil and to the uppermost portion (27) of which the incoming paper strip (28) is momentarily attached.

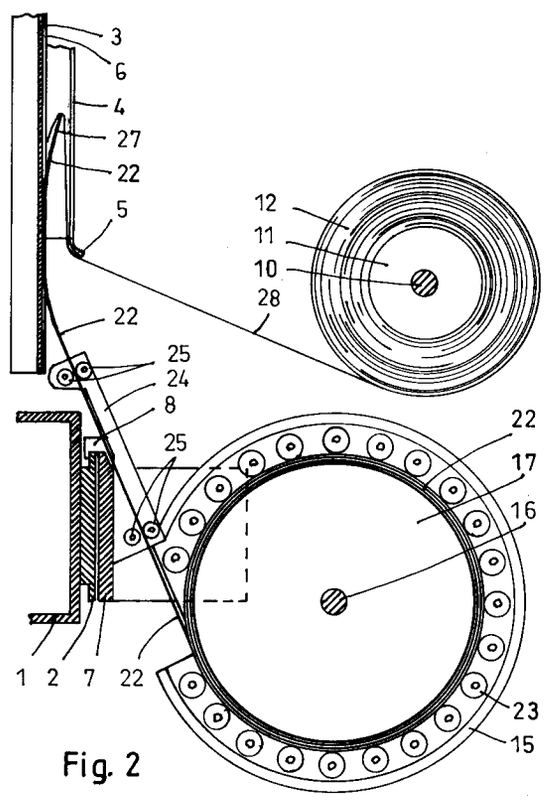

Fig. 2

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The present invention relates to signs of that type wherein each image is made up of a plurality of image portions located on rotatable prisms or display screens having a cross section such as that of an equilateral triangle.

Signs of this type are common and have existed for a long time. At many of these signs, the message is often replaced, e.g. once a week. Then, the message is often the same as on the billboards and it is supplied in a number of e.g. 6 or 18 sheets for a normally sized sign having a height of 3 m and a width of 4 m. At message replacement on these signs, one has hitherto removed the sides of the display screens from the core or body of each display screen. Each screen side has a height of 3 m and a width of 0,1 m and is made of metal. These removable screen sides are below referred to as screen blades and several patents exist relating to their design and attachment on the body.

At replacement of a message on a side of the sign, one removes all the screen blades on the front side of the sign. These screen blades are transported to an atelier, wherein the old message of paper glued onto the screen blades is removed by soaking and scraping. The clean screen blades are thereafter put up on a stand in the atelier and the new sheets are glued on to the screen blades. After drying, the narrow strips between the screen blades (later the display screens or prisms) are cut away. The screen blades are removed from the stand and transported to the sign for attachment. A set of screen blades for one side of a sign weighs normally about 70 kg. Of course, several sets of screen blades can be used, whereby the work is facilitated. It is however a substantial and time consuming work to clean, fix and transport the heavy screen blades.

The object of the present invention is to facilitate the replacement of messages consisting of the same paper posters used on common billboards.

This is arrived at primarily by providing each screen side with a plastic foil which covers said screen side and which is located at a small distance outside the screen side and by inserting from below into the space provided therebetween, the message in the form of a paper strip by means of a rigid band which from a coiled position on a tool located on a lower beam of the sign is brought to enter between the screen side and the plastic foil and to the uppermost portion of which the incoming paper strip is momentarily attached.

The invention has the characterizing features of the claims and will be further described below with reference to the accompanying drawings illustrating embodiments thereof in principal. For illustrative reasons, some dimensions are drawn exaggerated.

Fig. 1 illustrates an inserting tool provided on the lower part of the sign seen in the direction towards the sign.

Fig. 2 is a section A-A through the tool of fig. 1.

Fig. 3 illustrates the lower part of a screen blade with a plastic foil applied thereon.

Fig. 4 is a section B-B through the screen blade of fig. 3.

Fig. 5 is a section C-C through the screen blade of fig. 3.

In figs 1 and 2, the lower frame member of the sign is designated 1. A rail 2 is fixedly mounted thereon. Above the frame member, the lower portion of two screen blades 3 is illustrated. The attachment thereof is not shown, since it is not a part of the invention. On the sign there is of course a large number of screen blades, but for illustrating the invention only two screen blades are shown, outside which the inserting tool is situated.

The screen blades 3 are provided with transparent blades of a plastic foil 4 which enclose the longitudinal edges of the screen blades. The plastic foils extend at the top as far as the screen blades, but end at the bottom a short distance above the lower edge of the screen blades. The plastic foil is at its lowermost edge folded outwards a short distance 5.

The screen blades 3, preferably made of extruded aluminium, are provided with two ribs 6 which protrude from the otherwise planar surface. The plastic foil, which should be located at a short distance from the front surface of the screen blade, is in fig. 2 for illustrative purposes shown at a larger distance from said surface.

A plate, designated 7, constitutes the frame member of the tool. Two hooks 8 are fixedly mounted thereon and engage the rail 2 for retaining the tool on said rail. The tool is easily displaceable in sideways direction on the rail such that it can be located right in front of other pairs of screen blades 3. On the frame member 7 there is provided a bracket 9 and at the outer end of said bracket a shaft 10 is attached, which carries two rotatable rollers of which only one 11 is shown in the figures. The rollers are adapted to carry image lengths which are winded thereon. In this embodiment where the tool has two rollers, the number of image lengths on each roll when the insertion of said lengths begin is half the number of screen blades. Each image length is a paper strip, the width of which is essentially the same as that of the screen blade and the length of which is somewhat shorter than said screen blade. An outer arm can be provided (not shown), which resiliently engages the image lengths on the roller from the outside.

Two protruding supports 13 are attached to the frame member 2 and two circular hoods or covers 14 and 15 are mounted on the inner sides of said supports. In the centre of the hoods a shaft 16 is journalled and two wheels 17 are mounted on said

shaft. The shaft 16 protrudes at one end out from the hood 14 and a gear wheel for a toothed belt can be fixed at this end for rotating the wheels 17. A crank 18 is attached to the other end of the shaft. A cylinder 19 with a helical groove 20 is attached to the middle portion of said shaft. An arm 21 is at one end articulately connected with the support member 9 and at the other end formed such that it engages the groove and is guided thereby.

One end of a flexible rigid steel band 22 is attached to each wheel 17. This band is wound on the wheel. Outside the steel band a large number of rotatable pulleys 23 are attached to the hood. The rigid steel band engages the pulleys which enables cranking of said steel band. Two supports 24, each having four pulleys 25, are attached to the frame member 7. The supports define guide channels which guide the steel bands to the right position in the chutes or grooves formed between the protruding ribs 6. A wide support 27 is mounted on the outermost end of the steel band. An image length 28 is shown somewhat pulled out. At its outermost (uppermost) portion, said image length 28 is folded over the support 27. The steel band with the support 27 and the uppermost portion of the image length 28 has been inserted a short distance underneath the plastic foil 4.

In figs. 3-5, the lowermost portion of a screen blade 29 is shown at a larger scale. Along its longer or longitudinal edges, the screen blade 29 is provided with grooves 30. On the front side there is a plurality of longitudinal ribs 31 protruding from the surface. The two central ribs reach farthest out from the planar surface between the ribs. Particularly between these two ribs a chute 32 is defined, the purpose of which is to guide the steel band laterally.

A 0,7 mm thick UV-stabilized plastic foil 33 is at its edges formed such that said edges fit into the grooves 30. The plastic foil is applied on to the screen sides from one end of the screen blade and engage the screen blade tightly in both grooves 30.

The plastic foil, which is somewhat curved outwards, is located one or two millimeters outside the ribs 31 of the screen blade. Due to the grooves 30, the plastic foil is attached to the screen side such that it can not slide or shake down. At its lowermost portion, the plastic foil is folded out with a rounded edge 34 and end a short distance above the lower edge of the screen blade.

A plate spring 35 is by means of a rivet 36 pivotally connected with the lowermost portion of the screen blade. The plate spring may be pulled somewhat outwards at its free uppermost portion and then pivoted 90° to the side. In the position shown, the spring is prevented from pivoting partly due to its tension against the screen blade and partly because of the ribs 31. The purpose of the plate spring is to prevent the paper length from sliding or shaking down. The lower edge of the paper length may either rest on the upper part of the spring or the length may extend further down and be clamped between the spring and the screen blade. The latter might be preferred since it can facilitate the removal of the length.

In the embodiment illustrated in the drawings, screen blades are utilized. Three such screen blades are mounted on a central core or body and together they form a prism or display screen with a cross section such as that of an equilateral triangle. It is possible however, to use prisms or display screens wherein the three sides are fixedly connected. In such a display screen there must be grooves in the three longitudinal edges thereof so that the longer or longitudinal edges of the plastic foils, which then can be designed otherwise, can be inserted therein.

Before replacement of an image, the message in the form of 6-18 poster blades is set up in an atelier. It is the same blades that are used for sizing on common large billboards. The blades are sized or glued in their overlaps or cut edge to edge without overlapping and taped together. Hereafter, they are cut to strips of about the same width as the screen sides. During cutting, a narrow strip corresponding to the space between the display screens is cut away between each image strip. It is an advantage that the paper can be dry during cutting, since cutting then is easier to perform. The cut image strips are wound tightly on two rollers 11. Hereby, every second image strip is wound on one roller and every second on the other roller. When all lengths are wound on the respective roller, elastic strings are put around the rolls thus established, such that the lengths do not unwind. Instead of winding the lengths on the rollers 11, they can be wound on disposable cardboard cores or sleeves. These sleeves are thereafter mounted on the rollers 11, which then can be permanently attached to the tool.

At the sign the old message is removed by engaging by hand or with a special tool the lowermost portion of the length and pull it downwards a short distance. Thereafter, the length can either be wound on a roller or inserted between a pair of motor operated rollers which quickly pull down said length from the screen side. In the latter case, the lengths that are pulled out can be put in a box beneath the removing or withdrawing tool in a more or less folded condition. They can later be compressed and as a reject be used for recovery.

After removal of the old message, the inserting tool is located on the rail 2 of the sign and displaced sideways such that it is located right in front of the outermost pair of screen blades. The rollers 11 with the image lengths 12 are fixedly mounted

on the shaft 10, the elastic strings removed and an arm on the tool engages each roll (not shown) and prevents the lengths from unwinding. The application of the rolls on the shaft may of course be done also before the tool is mounted on the sign. Hereafter, both lengths 28 are pulled out somewhat and folded double at their ends, and said ends are located over the support 27, whereafter, by means of the crank 18, the steel bands with the supports 27 and the lengths provided thereon are inserted into the space between the screen blades and the plastic foils. During continued cranking, the lengths are pushed upwards more and more on the screen sides. A cover or cap can be located at the top of each screen blade. Said cover thus defines a stop for the pushing up of the image length. It also serves as a sealing against incoming rain and moisture.

When the lengths have been brought all the way up to the covers they are along their length in contact with the screen blade and the plastic foil and remain when the steel bands are withdrawn along the chutes 26 and wound or coiled on the wheels 17. The withdrawal and coiling is stopped when the supports 27 abut the guide channels 24. Hereafter, the tool is moved two display screen partitions to the side. The two plate springs 35 are swung back so that they prevent the image lengths set up a moment ago from sliding or shaking down during the sign's consecutive repeated presentation of its images, i.e. during rotation of the display screens of the sign. Hereafter, insertion of the two adjacent image lengths is initiated in the same manner as just described.

The unwinding and winding of the steel bands may be carried out by means of an electric motor and a toothed-belt transmission to the shaft 16. Hereby, an electric contact can be mounted in the arm 21, whereby the contact is affected by the end positions in the groove 20 in the cylinder 19. The contact in turn affects the motor. During cranking by hand, the cylinder can be deleted if the screen sides are provided with covers or caps as defined above.

Due to the invention work at the sign can be carried out only from the lower part of the sign, which is a great advantage since work at higher heights, particularly when it is stormy, might lead to accidents.

Thanks to the invention the only requirement for image replacement is the relatively simple and light tool for insertion and push up (set up) of the new message with the message wound on two small rollers or cardboard sleeves and a simple removing tool. This should be compared with the weight of about 70 kg for messages applied on screen blades, i.e. for only one message or image. Two or all three sides on the sign are often replaced or changed simultaneously. A comparison can also be done between the small volume of the tools and wound image lengths that are required according to the invention and the very large volume of the three meter long screen blades. Nothing of what is removed from the sign during image replacement need to be brought to the atelier.

Claims

1. Device for applying a removable message on a sign for consecutive repeated presentation of series of images and of the type wherein each image is made up of a plurality of image portions located on rotatable prisms or display screens having a cross section such as that of an equilateral triangle and wherein the same poster blades as for common billboards are used, **characterized in** that each prism or screen side (3) in an image is covered with a transparent plastic foil (4) which encloses both the longer or longitudinal edges of the screen side and which is situated at a small distance outside the surface of the screen side, and that during image replacement a tool is mounted on a lower beam (1) of the sign, which tool includes a wound or coiled rigid steel band (22) which band, along with an image length (28), can be inserted from below into the space between the screen side (3) and the plastic foil (4) and push up the image length on the screen side.

2. Device according to claim 1, **characterized in** that the screen side (3, 29) has a chute (26, 32) in the middle for guiding the band (22) in lateral direction.

3. Device according to claim 1 or 2, **characterized in** that each screen side (3, 29) is defined by a blade which is removable from the other blades and which has grooves (30) in the longer or longitudinal edges thereof that are adapted to the longer or longitudinal edges of the plastic foil (4, 33) so that the foil can be applied and removed only in the longitudinal direction of the screen blade.

4. Device according to any preceding claim, **characterized in** that the plastic foil (4, 33) is folded outwards (5, 34) down below and does not reach all the way down on the screen side.

5. Device according to any preceding claim, **characterized in** that the tool has rotatable pulleys (23) directly outside the band (22).

6. Device according to any preceding claim, **characterized in** that the tool is provided with a guide channel (24) with pulleys (25) for guiding the band (22) from its wound or coiled position into engagement between the screen side (3) and the plastic foil (4).

7. Device according to any preceding claim, **characterized in** that at the end of the band (22) there is provided a wide support (27) which during winding of the band is supported by the guide channel (24).

8. Device according to any preceding claim, **characterized in** that the tool includes a helical cylinder (19) with an arm (21), whereby limit stops on the band (22) can be obtained.

9. Device according to any preceding claim, **characterized in** that farthest down on the screen side (29) there is provided a device (35) for preventing the paper length from sliding or shaking down.

10. Method for applying a removable message on a sign for consecutive repeated presentation of series of images and of the type wherein each image is made up of a plurality of image portions located on rotatable prisms or display screens having a cross section such as that of an equilateral triangle and wherein the same poster blades as for common billboards are used, **characterized by** providing each screen side (3, 29) with a transparent plastic foil (4, 33) which covers the screen side and which encloses both the longer or longitudinal edges of the screen side and inserting into the space defined between the screen side and the plastic foil, the message in the form of a strip (28) of preferably paper by means of a rigid band (22) which from a wound or coiled position on a tool located on a lower beam of the sign is brought to enter between the screen side and the plastic foil and to the uppermost portion of which the incoming paper strip is momentarily attached.

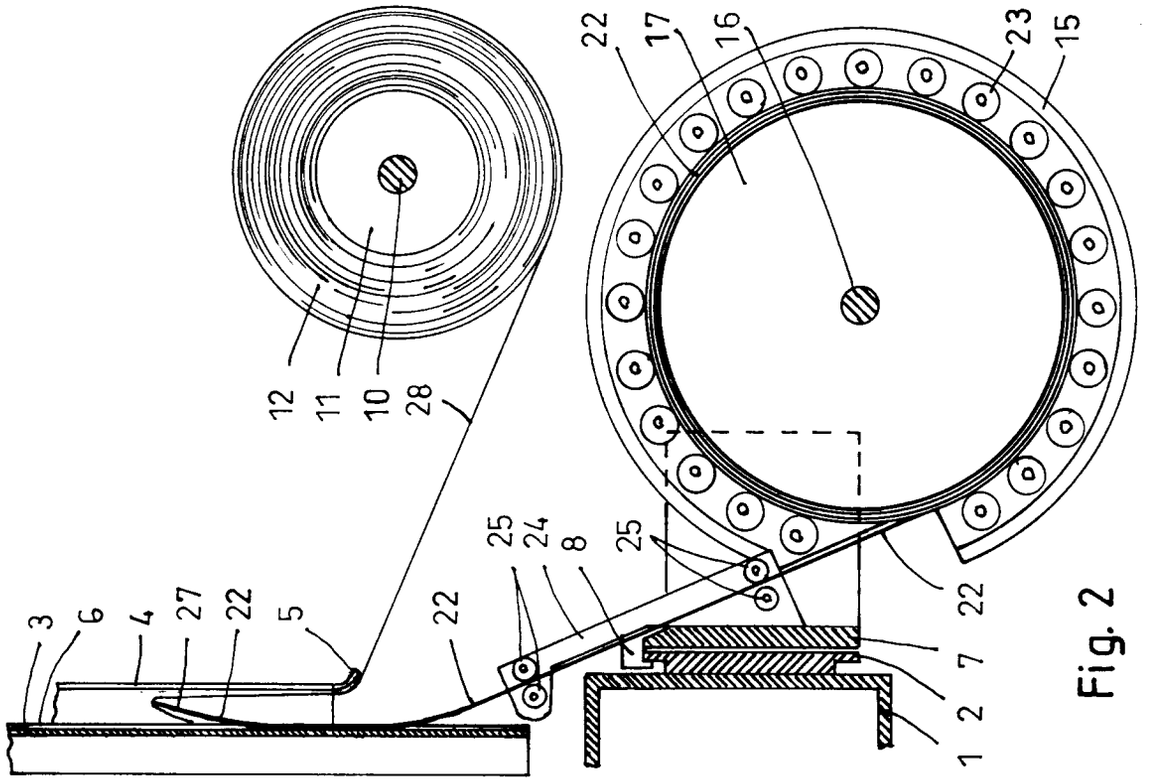
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Fig. 2

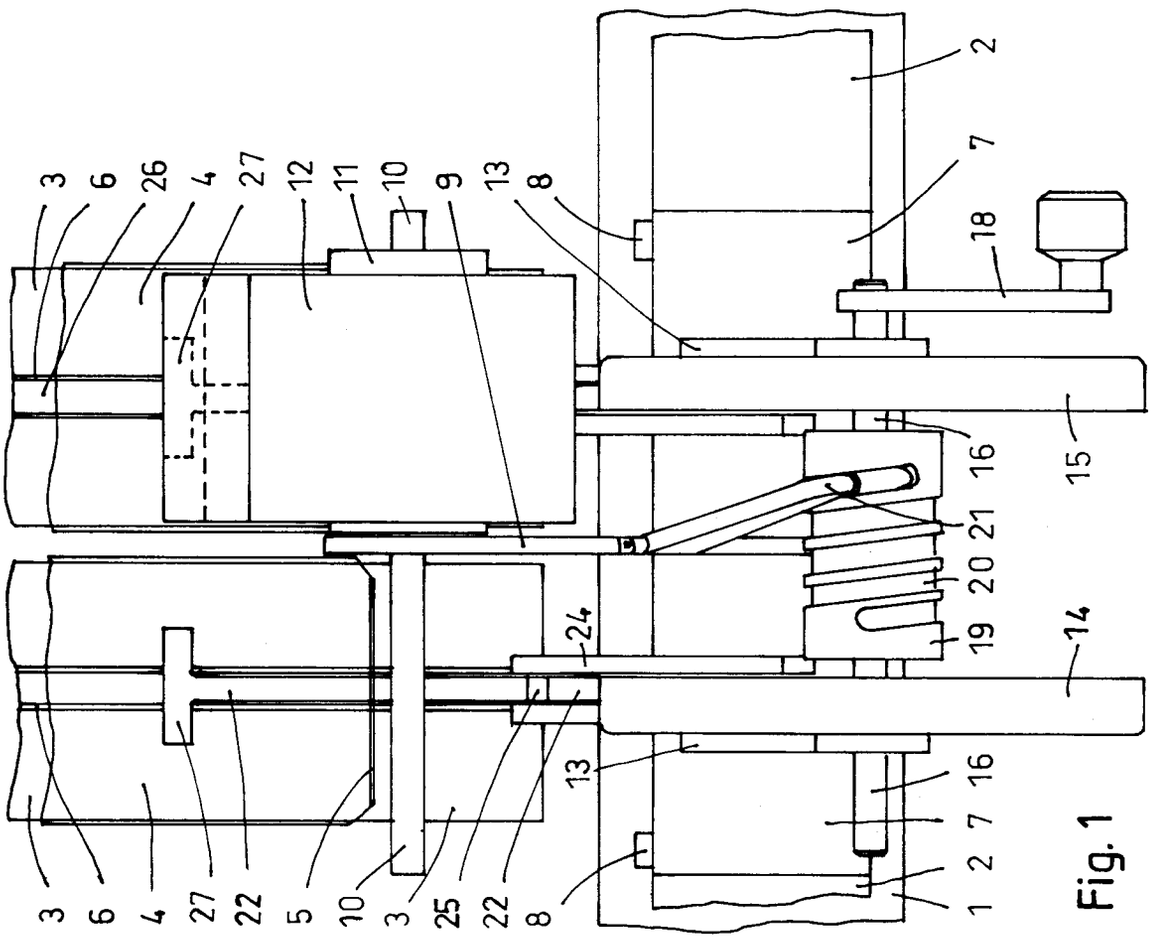
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Fig. 1

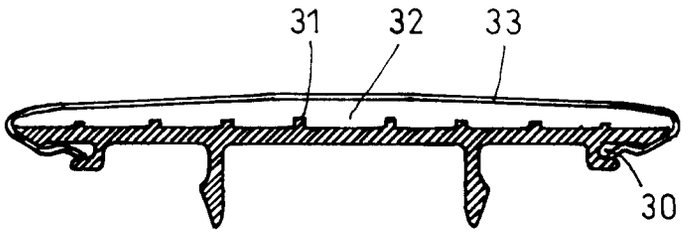

Fig. 4

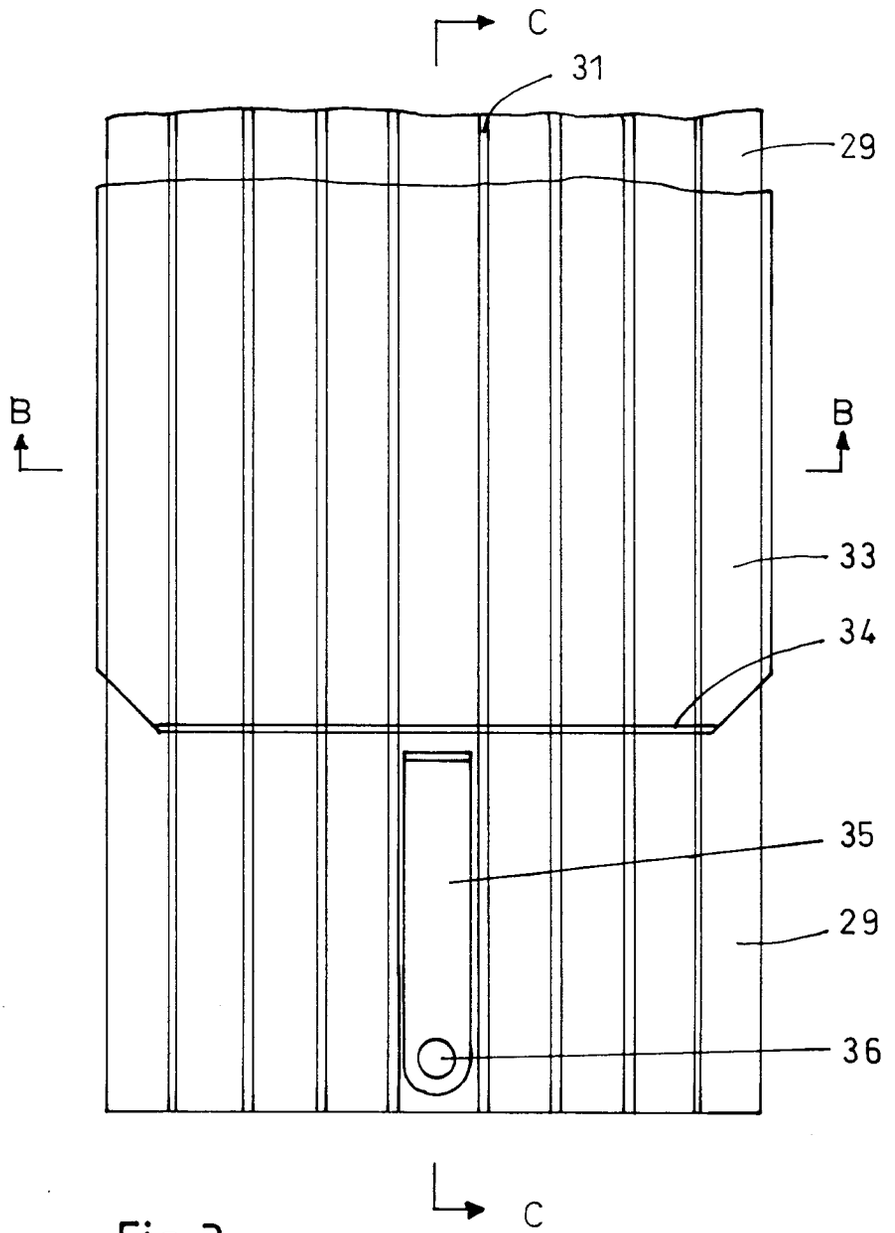

Fig. 3

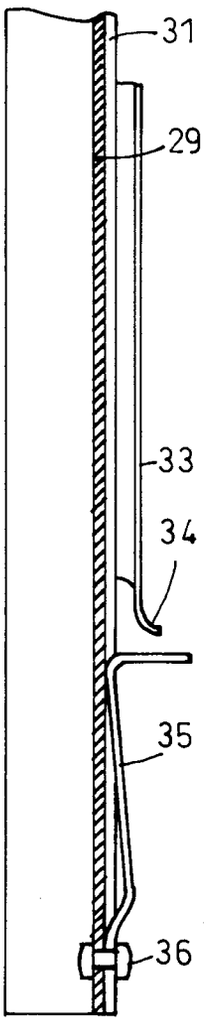

Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
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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.6)
A	US, A, 3367049 (C.L. NOREEN), 6 February 1968 (06.02.68) --	1-10	G09F 11/02
A	US, A, 3383785 (W.T. WERNER), 21 May 1968 (21.05.68) * column 3, line 18 - line 29, figure 2 * -----	1-10	

TECHNICAL FIELDS SEARCHED (Int. Cl.6)

G09F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
STOCKHOLM	14 December 1994	JAN KOSSMANN

CATEGORY OF CITED DOCUMENTS

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