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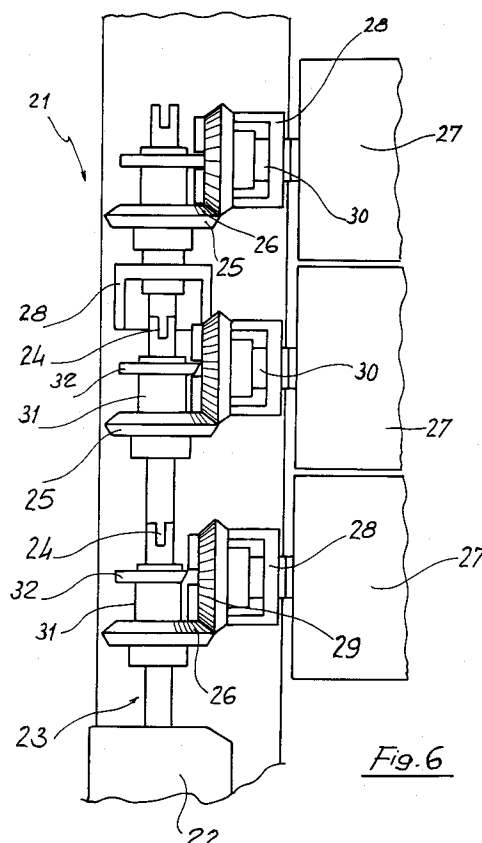
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(54) **Advertising board with rotating elements.**

(57) A system is described which allows the cyclic rotation of prismatic elements forming variable images on advertising boards. It consists of a system of gears with conical coupling at 90°, set into motion by a shaft in several sections driven by a motor reduction gear. The correct positioning of the gears on the rotating axis allows the advertising images to be displayed either with uniform synchronised rotation of the elements or with modulated wave form effect. The rotating prismatic elements are furthermore constituted by a central body divided in sections with connection seats for the sections forming the faces of the prism and bearing the various portions of the images to be displayed.

*Fig. 6***EP 0 499 324 A1**

This invention refers to advertising boards with rotating elements.

It is known that in the last few years advertising boards formed by rotating horizontal or vertical prismatic elements are widespread, each side of said elements having a strip constituting part of an image so that at each rotation a different side of the elements and thus a different image faces the observer.

Said elements are driven by a ratio-motor which imparts a rotation to each single element by means of a shaft in a synchronized or modulated way for instantaneous or gradual variation of the image, respectively.

In most cases the coupling between the shaft and the rotating elements is obtained by means of radial pins which interact in connection with the shafts or pins supporting the individual strips of the image.

Alternatively, chain mechanisms exist which make the elements rotate by means of toothed sprockets fixed to each rotation pin, or systems comprising a series of interacting sprockets, driven by a single gear of the motor reduction unit.

All the above mentioned mechanisms however have some disadvantages such as for example the fragility of an angular coupling with pins fixed to the driving shaft and the axis of the rotating elements, the high friction caused by the coupling of a series of top and auxiliary gears, as well as the difficulty of obtaining secure and durable synchronized movements, especially for reducing the maintenance operations on the boards which are usually positioned on very high structures, not easily accessible without an aerial lift platform to a minimum.

The board of this invention solves these disadvantages in practice since it utilizes a motion generation system and a taper fit coupling system at 90° with gears having only a portion of teeth able to give each element exclusively the rotation needed to change the image, together with a series of disc sectors which interact with the relevant seats made on the gears of each individual element, guaranteeing a perfectly flat arrangement of the visible portion of the image.

Not least is the system's advantage of the safety of rotation of all the elements forming the image also in the presence of wind and bad weather and the absence of maintenance since they are made entirely in plastic anti-friction material or similar.

This type of board has also caused some problems in the realisation of the prismatic rotating elements, which are usually in a triangular section and therefore have three faces displaying images to the observer especially due to the considerable lengths to be used without any central support.

Sections made of plastic material exist on the market which in time undergo deformations and aging of the material, or aluminium in triangular sections onto the faces of which the strips forming the advertising images are applied by means of an additional support. Furthermore there are lateral supports provided only with bushings in plastic material which ovalize in time creating deformations of the advertising images as the perfect synchronization of the rotation is compromised.

To solve this problem, the board according to this invention has an aluminium shape with a central cylindrical body and three double radial finings which provide a support for another aluminium shape forming the prismatic surfaces, onto which the strips of the images to be displayed are applied.

A characteristic to be emphasized is that a tubular element with ball bearings or supports can be inserted directly into the central shape, allowing an optimum rotation of each prismatic element, with minimum friction and reduced installed power.

Furthermore, for the substitution of an advertising image the board does not need to be taken apart as the shapes forming the faces of the prism can be detached in order to fit others with the new image.

These, and other characteristics are shown even better in the following detailed description, given purely as an example and not limiting the scope of the invention, with the help of the appended sheets of illustrative drawings, in which:

Figure 1 shows a sectional view of the support shape of a triangular prismatic element highlighting its form with a central body of cylindrical configuration from which the fins are extending;

Figure 2 shows a sectional view of the shape forming the faces of the prism after coupling with the seats of the element of Figure 1;

Figure 3 shows a sectioned whole view of the prismatic support produced by means of the assembly of the two shapes shown in Figures 1 and 2;

Figure 4 shows a schematic lateral view of a portion of advertising board made with the prismatic supports of this invention;

Figure 5 shows a perspective schematic view of an advertising board made with rotating prismatic bodies;

Figure 6 shows a schematic view of the whole of the motion generation system of the prismatic elements, highlighting the coupling between the bevel gears and the insertion of the sectors in the corresponding seats on the gears fixed on the axes of the rotating elements of the board;

Figure 7 shows a front view and a lateral view of the support used both for the command shaft and the pins of the head of the rotating ele-

ments of the board;

Figure 8 shows a lateral view and a front view of the gears fixed on the axes of the rotating elements of the board, in order to highlight coupling seats for the corresponding sector; and

Figure 9 shows a lateral view of a detail of the peripheral sector and a front view of the partially toothed gear.

First with reference to Figures 1-5, the first of the improved elements refers to an aluminium shape 1 with a central body 2 in tubular form, of which the circumference is interrupted in three equidistant radial points 3 to connect up with three series of double fins 5.

The latter connect perpendicularly with the flat surfaces 6 functioning as seats for the male fastening for the shape 7 which functions as a prismatic face onto which a strip 8 of the image 9 is applied.

This last shape 7 in turn has the female seat 11, in internal part 10, for the aforementioned coupling and its ends 12 are tapered in order to form the apices 13 of the prismatic body precisely and coincidentally. The central part 2 of shape 1, as shown in Figure 2, functions as a seat for the insertion of a tubular element 12 with ball bearings, functioning as a motorized support for each linear element of the advertising board 15.

Now referring to Figures 6-9, the motion generation system 21 comprises a ratio-motor 22 of known type which rotates the shaft 23 with axial joint sections 24 onto which partially toothed 26 conical sprocket 25 is fixed for each rotating element 27 of the board, the whole of which is supported by saddles 28 with appropriate ball bearings or self-lubricating bushing.

Each sprocket 25 cited interacts with a second sprocket 29 attached to a pin 30 of rotating elements 27 of the advertising board, these too supported by a saddle 28 with ball bearings or bushing.

Each pinion 25 fixed onto motorized shaft 23 comprises an elongated cylindrical body 31 onto which there is a sector 32 of 242° of development, which during rotation is inserted in the plane seats 33 on the frontal part 34 of the pinion 29 fixed on the axes of rotating elements 27 of the board.

Said seats 33 are bored every 60° with respect to the centre in order to allow the passage of sector 32 which is inserted every 120° as the rotating elements 27 of the board have a triangular section.

Each sector has a bevelled head 34 to allow gradual insertion of the sprocket in the relative seat during the rotation phase.

The driving sprockets 25 in turn have only a portion of toothing 26 to allow the free rotation of the motor shaft 23 both for the complete insertion of the sector 32 in seats 33 of the sprockets and

for the disengagement of the same before starting the new rotation of 120° of the elements of the board for changing the advertising image.

Clearly, the sector is made radially in an opposite position with respect to the toothed section to allow the cyclic engagement and disengagement of the said sector.

The latter is in fact inserted when the teeth have already made a rotation of 118° and the last tooth is disengaging from the conical wheel stopping at 120° by means of micro-switches, and therefore the whole development of the sector, including the insertion bevel amounts to 242° as already mentioned.

Finally, it must be emphasized that the detailed description of this form of embodiment does not limit the scope of the invention but on the contrary it must be understood that numerous modifications, variations, additions and substitutions of elements can be brought to the device of this invention without thus altering either its spirit or its object, nor leaving its scope of protection as is also defined in the appended claims.

Claims

1. Advertising board with rotating prismatic shaped elements, provided with motion generation means comprising parallel and interconnected motor shafts, characterized in that said motion generation means comprises a series of taper fit transmission gears at 90°, motorized sprockets and coupling and stabilising sectors to impart the rotational movement to each individual element forming the advertising image, by means of a single shaft driven by a ratio-motor.
2. Board according to claim 1, characterized in that each motorized sprocket comprises only one portion of teeth to impart a rotation of 120° to the rotating element while the remaining untoothed part rotates during the insertion and disengagement from the stabilising sector of the image displayed on the advertising board in front of the observer.
3. Board according to claim 2, characterized in that said sector inserts itself into the corresponding seats made on the front part of each gear fixed onto the axes of the rotating elements, in order to arrange the parts of the image on the advertising board with maximum plane precision.
4. Board according to claim 1, characterized in that the sprockets fixed onto the axes of the rotating elements of the board have seats built

in at an interval of 60°, in order to allow both the connection of the sector every 120°, and the disengagement of the same during the starting of the subsequent rotation.

5. Board according to claim 1 characterized in that it comprises a driving shaft having sections with jointed connections, in order to allow the same to be taken apart easily with relative pulleys for maintenance.

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6. Board according to claim 1, characterized in that each rotating prismatic shaped element essentially comprises a central body with circular configuration, divided in three peripherally equidistant sections, from which the double fins are extending, connected to the coupling seats for the shapes forming the faces of the prism.

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7. Board according to claim 6, characterized in that said central body allows the insertion of a tubular support element for generating the motion of the prismatic body.

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8. Board according to claim 6, characterized in that said tubular support element is previously provided with ball bearings in order to reduce rotation friction with the consequent use of reduced power for generating motion of the advertising board.

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9. Board according to one or more of claims 6-8, characterized in that the surfaces to which the individual strip of an advertising image is applied, is constituted by an aluminium shape with a flat configuration at the front and provided with a female fastening means behind for the connection of the central shape.

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10. Board according to claim 9, characterized in that said shape has ends which are tapered towards the front, in order to allow the coincidence of the three apices forming the rotating prism.

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11. Board according to claim 9, characterized in that the shaped elements are connected by joints, so that said shapes may be substituted to change the strips of the advertising image, without taking apart any supporting prismatic element or the motion generating means of the board.

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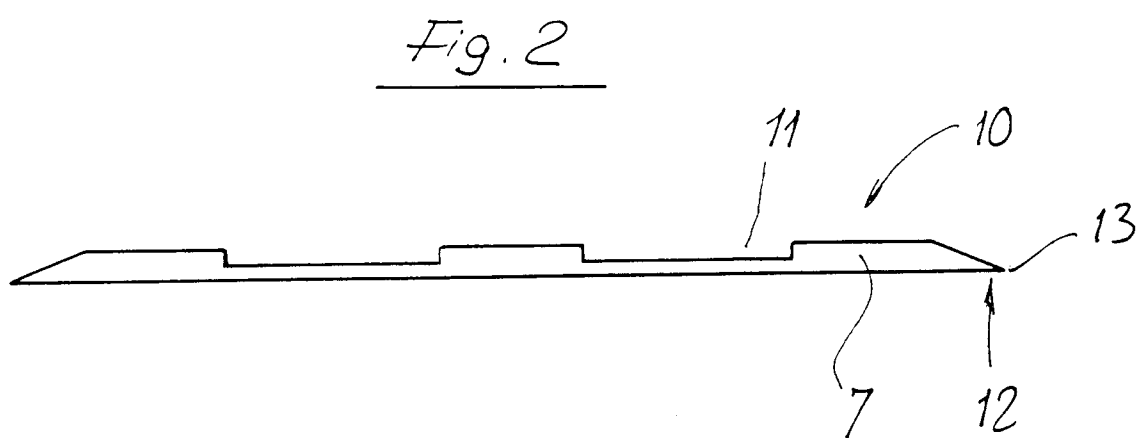
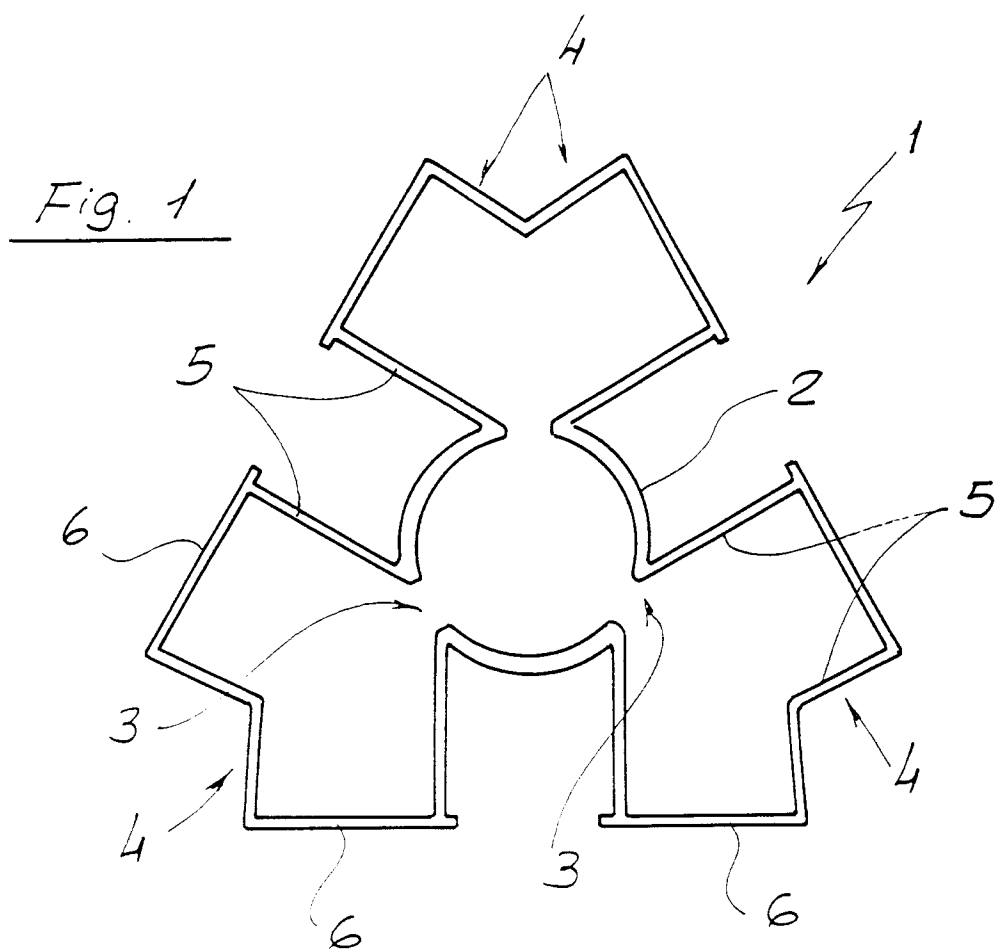


Fig. 4

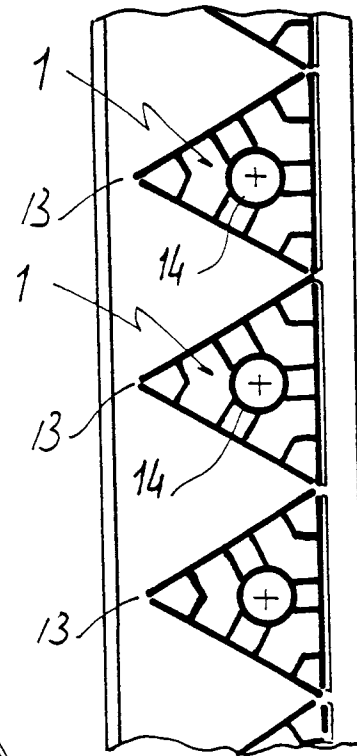


Fig. 3

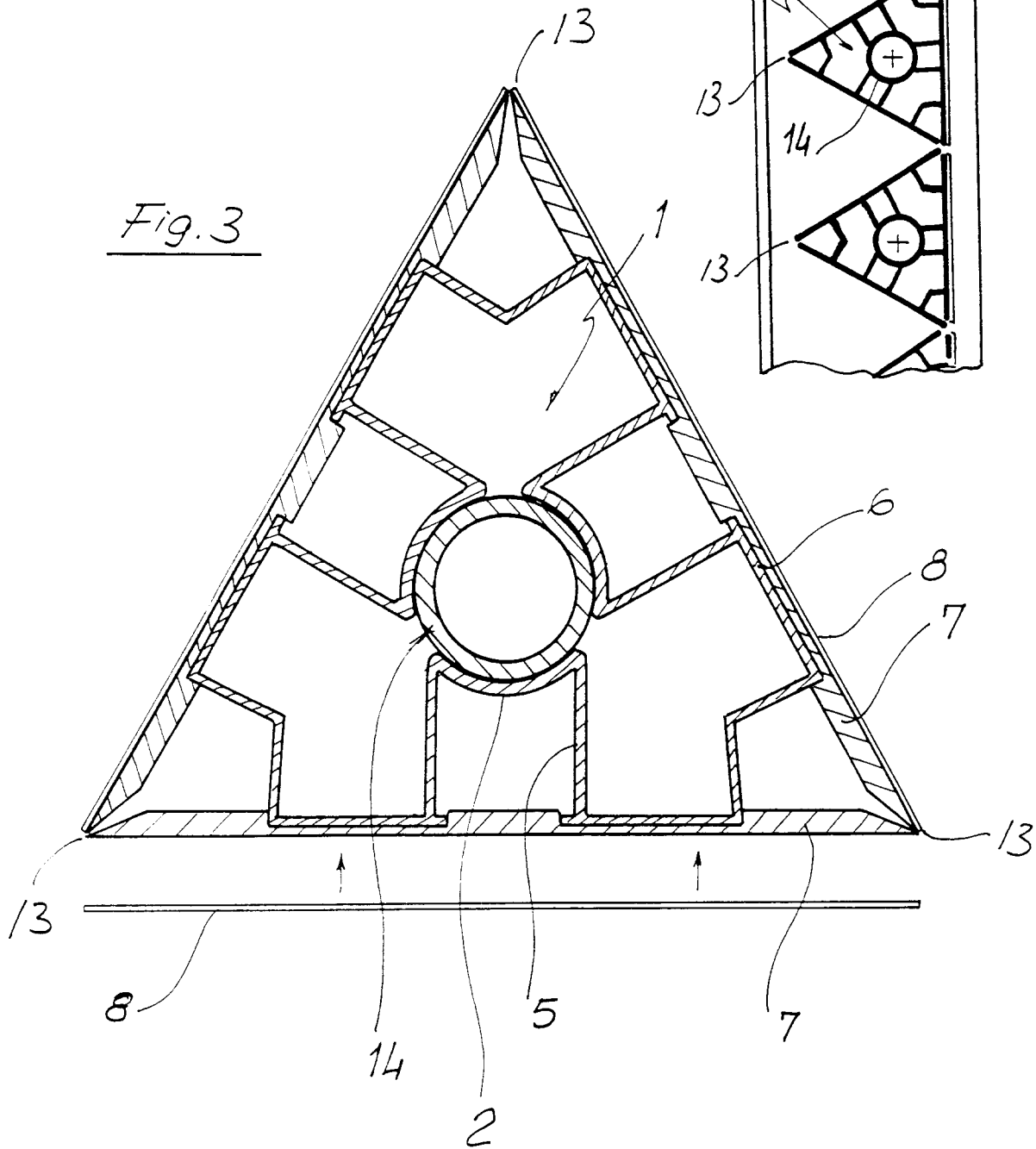
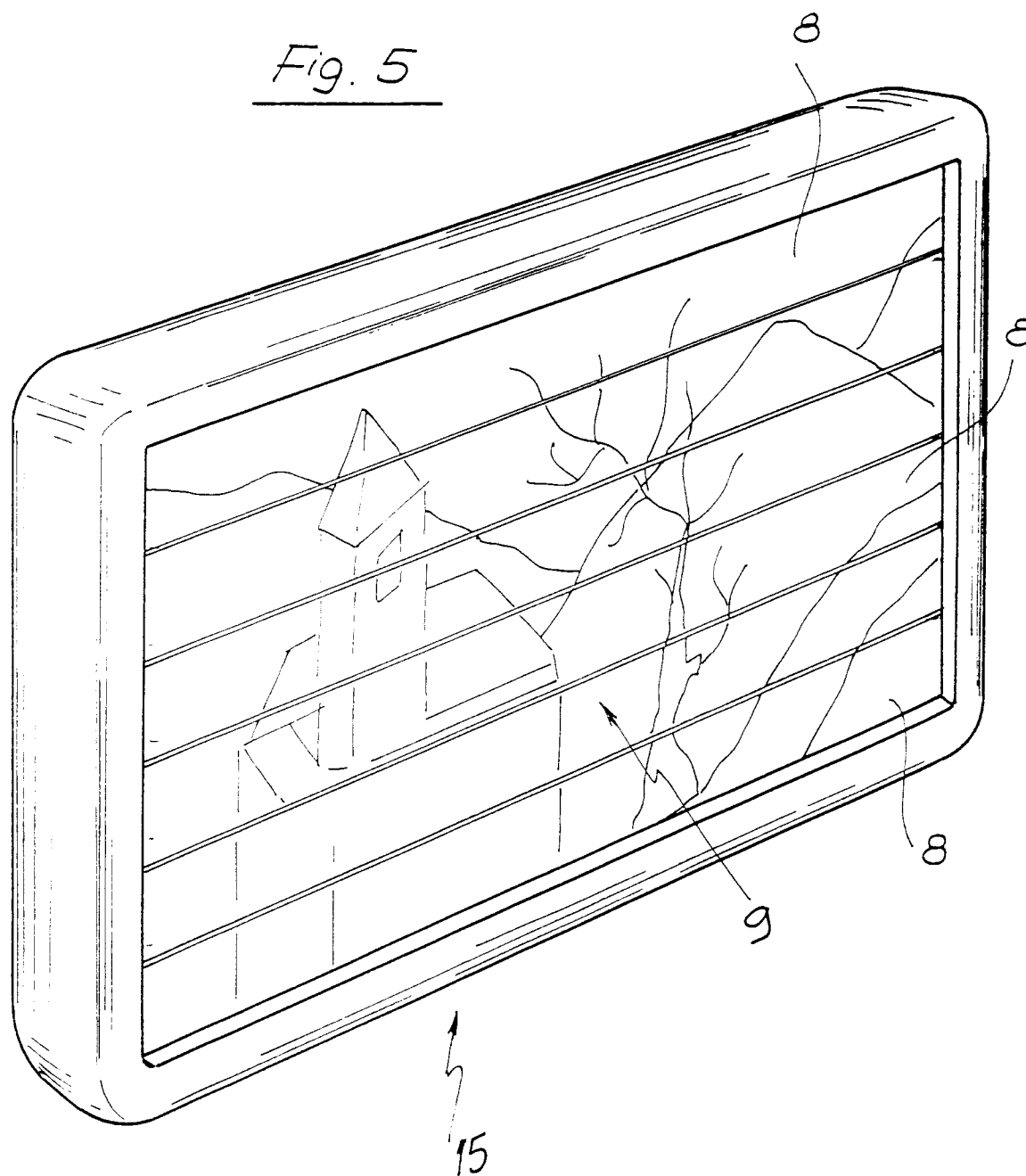


Fig. 5



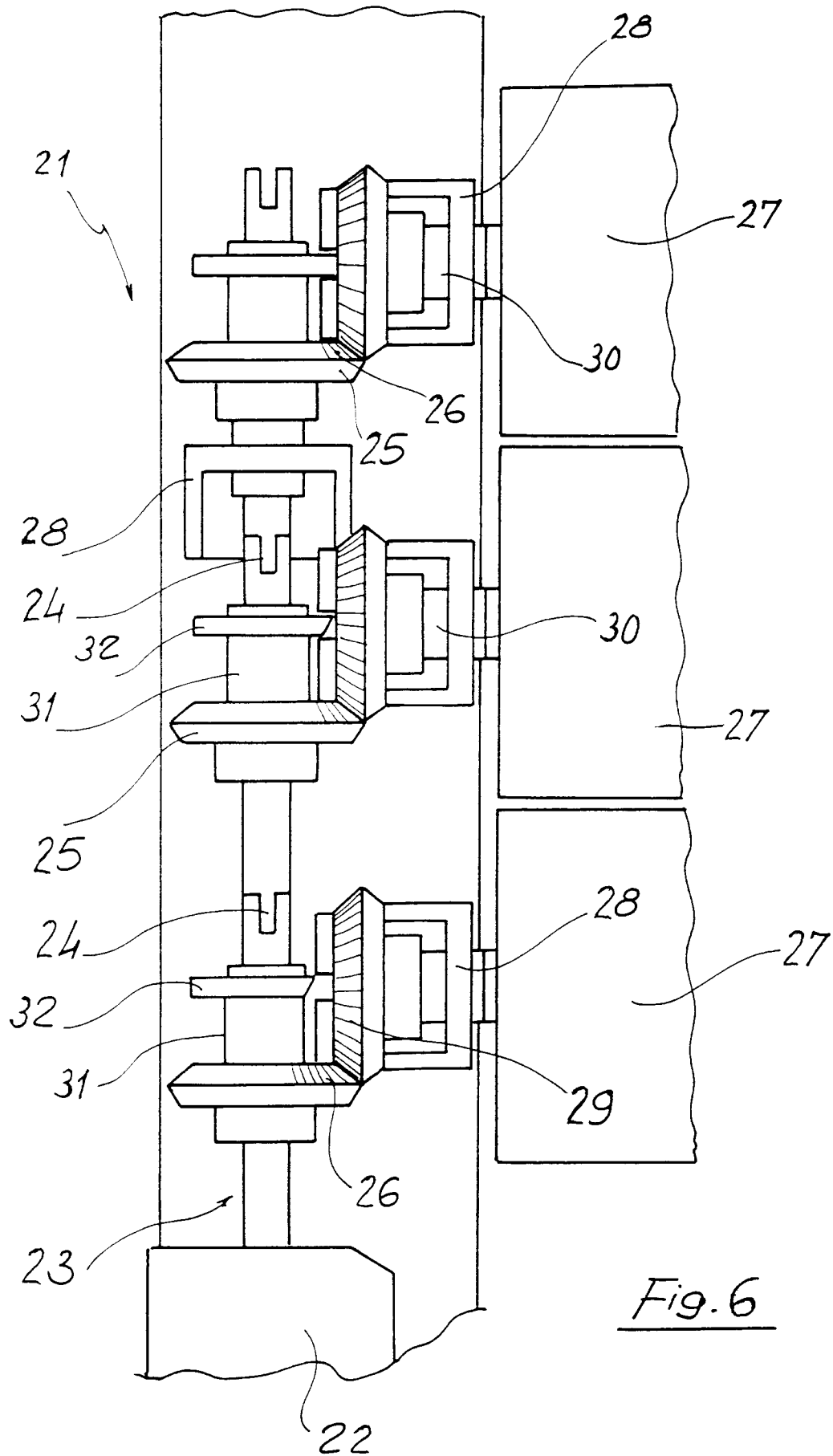
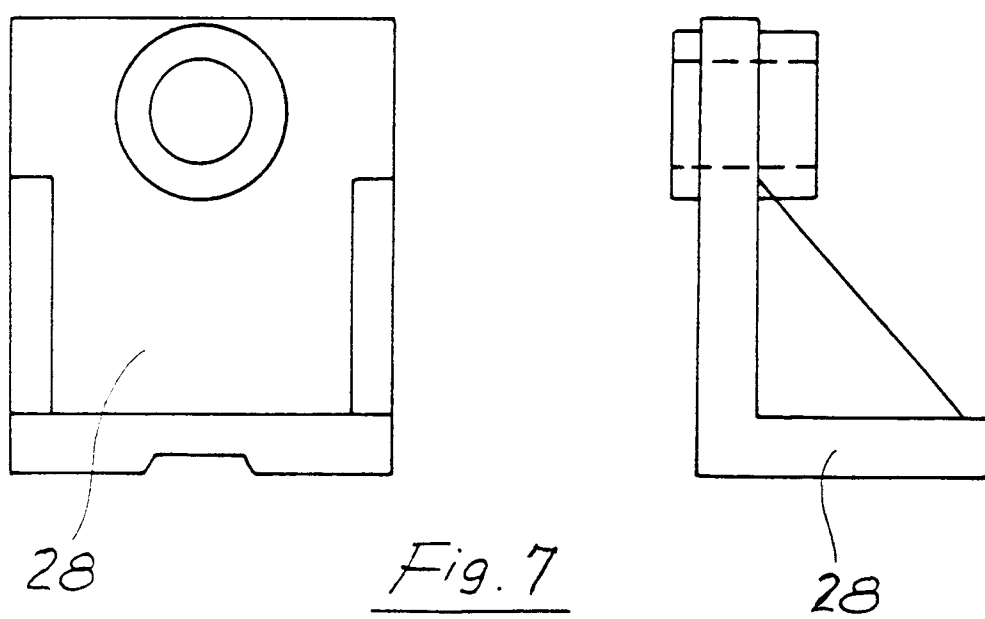
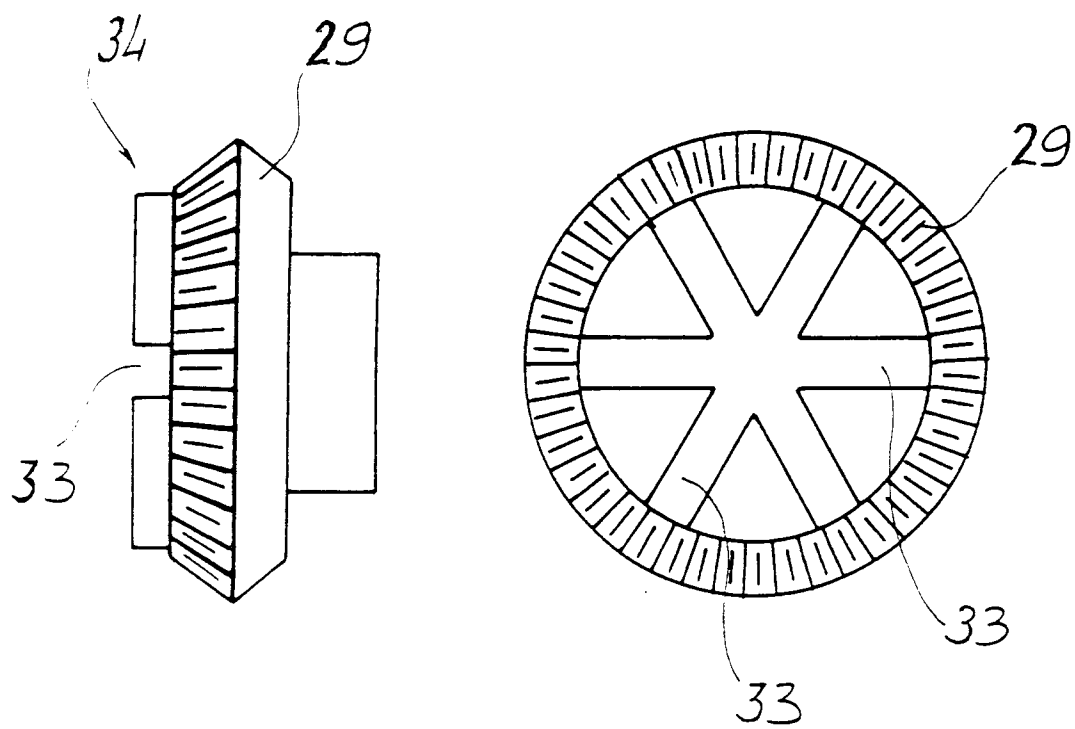


Fig. 8



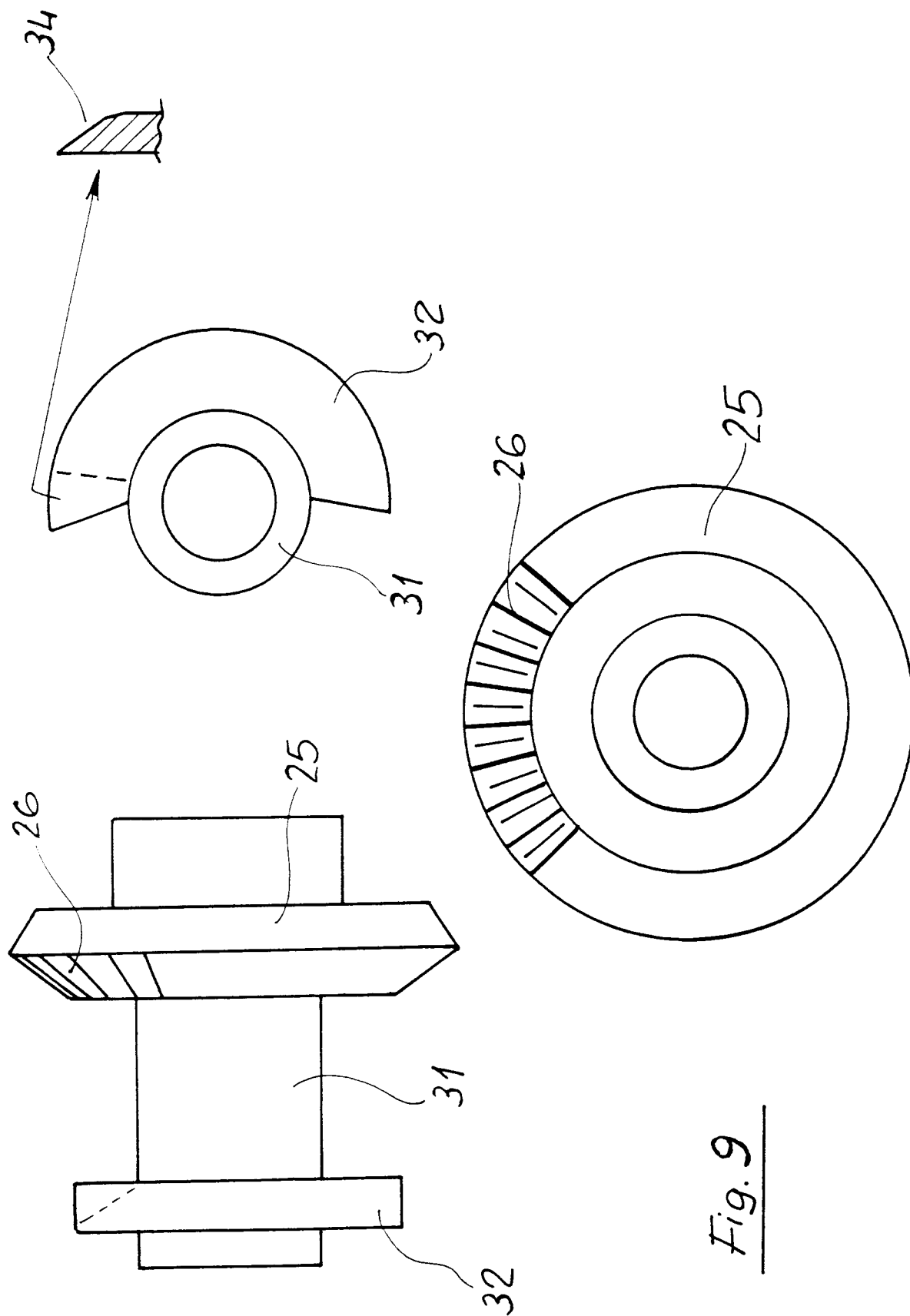


Fig. 9



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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 0355

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)
A	EP-A-0 162 254 (ELETTRIK ELCAT S.N.C) * page 2, line 24 - page 7, line 3; figures 1,2,7 *	1,2,5	G09F11/02

A	GB-A-2 105 895 (ULTRAVISION LTD.) * the whole document *	1,2,6,7,9,10	

A	EP-A-0 406 222 (H.WIKTURNIA) * the whole document *	1,6,9,10	

A	WO-A-9 102 342 (D.J.FURNELL) * page 5, line 7 - page 10, line 9 *	1	

			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			G09F
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 17 MARCH 1992	Examiner P.Taylor
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	