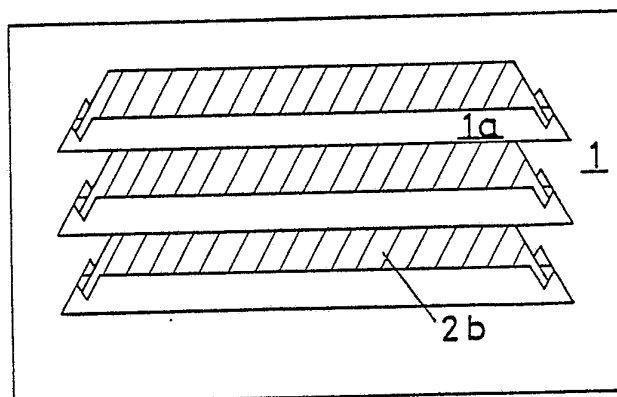




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>3</sup> :  G09F 11/30	A1	(11) International Publication Number: WO 83/ 02517 (43) International Publication Date: 21 July 1983 (21.07.83)
(21) International Application Number: PCT/DK83/00004 (22) International Filing Date: 13 January 1983 (13.01.83) (31) Priority Application Number: 168/82 (32) Priority Date: 15 January 1982 (15.01.82) (33) Priority Country: DK (71)(72) Applicant and Inventor: HOLK, Jon [DK/DK]; 23 Vennemindevej, DK-2100 København Ø (DK). (74) Agent: BUDDE, SCHOU & CO.; H.C. Andersens Boulevard 4, DK-1553 København V (DK). (81) Designated States: AU, BR, DE, DE (Auxiliary utility model), FR (European patent), GB, JP, NO, SE, US.		Published <i>With international search report.          In English translation (filed in Danish).</i>

(54) Title: A CASSETTE AND AN APPURTENANT APPARATUS HAVING A SCREEN FOR CYCLICAL DISPLAYING OF A PLURALITY OF PICTURES



## (57) Abstract

The cassette to be used in an apparatus having a screen for showing a plurality of different pictures sequentially comprises two sets of sheets, each being divided in strips (1a, 1b, 1c resp. 2a, 2b, 2c). The strips are made by cutting lines which at their ends are joining openings. The openings in the sheets of the foremost set extend upwards from the cutting line, and the openings in the sheets of the rearmost set extend downwards from the cutting line. Thus the sheets and hence the strips are mutually displaceable in a vertical direction, and the picture segments on the strips (2b) in a sheet belonging to the rearmost set can be displaced upwardly beyond the upper edges of the strips (1a) in a blank front sheet (1). Corresponding picture segments on the strips in a sheet belonging to the foremost set can be displaced further upwards to cover the remaining segment of the strips in the front sheet (1a), whereby a complete picture becomes visible. The vertical movements of the sheets can be controlled by motor-driven guide means acting on the marginal portions of the sheets. For each picture to be shown, the cassette has to contain only two sheets carrying identical pictures, i.e. a picture sheet in the foremost set and a picture sheet in the rearmost set.

***FOR THE PURPOSES OF INFORMATION ONLY***

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	LI	Liechtenstein
AU	Australia	LK	Sri Lanka
BE	Belgium	LU	Luxembourg
BR	Brazil	MC	Monaco
CF	Central African Republic	MG	Madagascar
CG	Congo	MR	Mauritania
CH	Switzerland	MW	Malawi
CM	Cameroon	NL	Netherlands
DE	Germany, Federal Republic of	NO	Norway
DK	Denmark	RO	Romania
FI	Finland	SE	Sweden
FR	France	SN	Senegal
GA	Gabon	SU	Soviet Union
GB	United Kingdom	TD	Chad
HU	Hungary	TG	Togo
JP	Japan	US	United States of America
KP	Democratic People's Republic of Korea		

- 1 -

0

A Cassette and an Appurtenant Apparatus having a Screen for Cyclical Displaying of a Plurality of Pictures.

The invention relates to a cassette for an apparatus having a screen for cyclical showing of a plurality of pictures, each being composed of picture segments on at least two groups of horizontal strips, the strips in each individual group being made in one continuous sheet and being separated from one another by horizontal cutting lines extending between two marginal portions of the sheet, and the various sheets being placed upon each other in such manner that the strips carrying the picture segments are gathered in a number of piles equal to the number of strips in each sheet, and the number of strips in each pile being equal to the number of picture forming groups, and each single sheet - with the group of strips formed therein - being displaceable in the plane relative to the other sheets, i.e. relative to the other strips in the piles, in such manner that the picture segments on them become visible and together with picture segments on at least one more displaced group of strips in another sheet form a continuous picture.

The word cassette as used herein is meant to denote an easily replaceable unit comprising a plurality of groups of strips, where the strips in each group are forming a picture and the strips in the different groups are overlapping each other in a louverlike manner and are mutually displaceable by simultaneously moving all strips in one and the same group relative to all other groups, whereby edge portions of the strips in the group in question will become visible and together with edge portions of other displaced strips are adapted to constitute a complete picture.

In known cassettes, each strip is suspended in straps which are moved up and down by guide means which in timed periods are displacing picture carrying edge portions of the individual groups of strips into a visible position in order to display a number of pictures sequentially (cf. Danish Patent Application No. 369/70). This method of



- 2 -

0 suspending and moving the picture carrying strips is rather complicated, and has the effect that the cassette becomes rather thick, and that each individual picture must be composed of relatively narrow edge portions on three or more  
5 groups of strips, since each strip can only be displaced along a fraction of its height, because the strips of the different groups which together form a picture, with a view to an adequate control must overlap each other like persi-  
ennes or louvers, in the position of rest as well as in the  
10 position of display thereof.

Further, from U.S. Patent Specification No. 3,659,367 it is known to use two sheets, each of which is divided in a plurality of picture carrying strips by means of cutting lines which at their ends join a short  
15 cutting line situated perpendicular to the first cutting line in the marginal portion of the sheet. By mutual displacement of the sheets two different pictures can be shown alternately, but it is not possible to produce a greater number of pictures, e.g. 5 or 6 pictures successive-  
20 ly, by one single cassette.

It is the object of the invention to provide a relatively thin cassette of the kind dealt with, which is easy to produce and is easily replaceable and which is adapted to display a greater number of pictures than hither-  
25 to possible, said cassette having strips which by simple guide means can be displaced safely over a substantial part of their height, preferably in such manner that only two groups of picture carrying strips are needed to form a whole picture.

30 Further, it is an object of the invention to provide an apparatus having simple guide means for safe control of the strip movements.

The cassette according to the invention is characteristic in that the cutting lines between the strips in  
35 a picture forming group in a first sheet at the marginal portions join openings which are all pointing away from the cutting line in the same vertical direction, and that the



- 3 -

0 cutting lines between the strips in a second picture form-  
ing group for the obtaining of the same picture all at  
their ends in the marginal portions join openings pointing  
away from the cutting line in a direction opposite to the  
5 direction of the first mentioned openings.

The simultaneously displaceable strips in each  
group are made by simple punching in a sheet, e.g. a sheet  
showing a complete picture, and the displacement of a group  
of strips is simply effectuated by displacement of the -  
10 sheet of which they form part, by means of guide means  
engaging the marginal portions of the sheets. The cassette  
that consists of flat sheets lying upon one another, has  
a small thickness compared to the number of different pict-  
ures that can be shown, and because the openings in the  
15 sheets to be moved when showing a picture are pointing in  
opposite directions, it has become possible to show for  
instance 6 different pictures successively.

As the strips in two groups or two sheets can be  
mutually displaced over the entire strip height, a pre-  
20 ferred embodiment of the invention is characteristic in  
that the strips in those groups that together are forming  
a complete picture are arranged in only two sheets, each of  
which is carrying a complete picture on the group of picture  
carrying strips formed in the sheet. Since each picture to  
25 be displayed requires only two identical picture sheets or  
possibly only one picture, the picture forming segments  
of which are distributed on the two sheets and spaced from  
one another by a strip width, a saving as well as a re-  
duced cassette thickness are obtained when comparing with  
30 known cassettes containing three or more identical picture  
sheets for each picture to be displayed.

The openings at the ends of the cutting lines may  
for instance be isosceles triangles which can be punched by  
a simple tool.

35 If desired, the cassette according to the invention  
may simply comprise two sheets having oppositely pointing  
openings and each carrying its own picture, or possibly it



- 4 -

0 may comprise a picture-less sheet and a single picture  
carrying sheet, but ordinarily it is made so as to show  
several, say five or six different pictures successively.  
According to the invention, this can be effectuated in that  
5 the sheets cooperating in pairs and carrying the same picture  
are arranged each within their own set of sheets, and  
that the openings in all the sheets in one set are pointing  
in opposite direction of the openings in all the sheets in  
the other set. By placing a preferably picture-less station-  
10 ary front sheet in front of the sheets in each of the  
sheet piles, a secure guidance of the sheets with the picture  
forming strips is obtained, and it has become possible  
to arrange an advantageous pause between the display of the  
individual pictures.

15 According to the invention, the sheets with the  
picture forming strips may in their marginal portions have  
means, e.g. securing holes or clamps. Hereby it is ascertain-  
ed that they will be correctly arranged in vertically move-  
able guide means in a display apparatus which according to  
20 the invention has corresponding gripping means to be coupled  
to the marginal portions of the picture forming sheets.

The invention is explained in greater detail in the  
following with reference to the drawing where

25 Figure 1 shows a first front sheet in an embodiment  
of the cassette according to the invention,

Figure 2 shows a partial picture of a second front  
sheet in the same cassette,

30 Figure 3 and 4 in plane view and in a vertical  
section respectively, the two front sheets shown in their  
relative positions in a display apparatus,

Figure 5 a front view of a part of the cassette in  
which the rearmost of two cooperating picture sheets has been  
displaced so upwardly that a display zone on each strip has  
become visible,

35 Figure 6 a partial picture illustrating the  
positions of the individual strips in the cassette in the  
condition shown in Figure 5,



- 5 -

0

Figure 7 a part of the cassette in which the foremost picture sheet cooperating with the picture sheet in Figure 5 has been moved upwards in such manner that the display zones of the strips have become visible and are completing the display zones on the picture sheet shown in Figure 5, and

Figure 8 a partial picture illustrating the relative positions of the strips in the situation shown in Figure 7.

10

The embodiment to be described of the cassette according to the invention, has a front sheet 1 which by a plurality of cutting lines 3 has been divided in pictureless strips 1a forming a group. At each end of the cutting lines 3 an opening 4 has been punched out, forming an isoscele triangle extending upwardly from the cutting line. As appears from Figures 6 and 8 a number of picture carrying sheets (two sheets in the case shown) have been arranged behind the front sheet, said sheets being provided with strips 1b, 1c which in their initial position are lying directly behind the strips 1a. These sheets are punched out in the same manner as the front sheet 1 in Figure 1.

Behind this first-mentioned set of sheets a second set of sheets is located, the sheets having punched cutting lines 3 and triangular openings 5 extending downwards from the corresponding cutting line 3 as shown in Figure 2. Behind the front sheet 2 is a picture carrying sheet having strips 2b constituting a picture similar to the one formed by the strips 1b in the first picture carrying sheet of the first set, and rearmost is a second picture carrying sheet with strips 2c carrying a picture which is identical with the picture formed by the strips 1c in the last sheet of the first set.

The cassette is placed in a display apparatus, not shown, having holding and guiding means engaging the marginal portions of the sheets and holding the front sheets 1 and 2 aligned in their positions shown in Figures 3 and 4, while the strips 1b and 1c, not shown, in Figure 4 are extending



- 6 -

0 analogous with the strips 1a to the right thereof, and the  
strips 2b and 2c, not shown, are extending analogous with  
the strips 2c and are lying between the strips 1a and 2a  
in Figure 4. The holding and guiding means can move the  
5 picture carrying sheets with the strips 1b, 1c, 2b, 2c in-  
dividually in vertical direction. The guiding means are  
actuated by a motor and programmed to move in such manner  
that after a picture-less screen formed by the strips 2a,  
successively after each other follow a picture constituted  
10 by the strips 1b and 2b and then a picture constituted by  
the strips 1c and 2c, possibly with a picture-less screen  
between each picture. For the sake of simplicity it is here  
shown and described only how two pictures are alternating,  
but it will be understood that several pictures, e.g. six  
15 pictures, can be successively displayed, in which case a  
corresponding number of picture carrying sheets with piles  
of strips lying upon each other are provided. If desired, a  
cassette can also comprise more than two picture carrying  
sheets having cooperating identical pictures, each of which  
20 is divided in a group of strips. However, it is an essential  
advantage of the cassette according to the invention, that  
more than two identical picture carrying sheets for each  
picture to be displayed are not required. The guiding means  
in the displaying apparatus are advantageously provided  
25 with pinlike members adapted to engage corresponding  
apertures 6 (Figure 2) in the marginal portions of the sheets  
in order to ensure correct locating of the sheets in the  
apparatus. The marginal portions of the sheets could also  
be provided with clips or projecting lugs cooperating with  
30 gripping members on the guiding means.

When a picture corresponding to the one constituted  
by the strips 1b and the strips 2b respectively, is to be  
displayed, the sheets are moving in the following manner:

By an upward pull in the first picture carrying  
35 sheet in the second set of sheets, the strips 2b are moved  
up beyond the upper edges of the strips 1a in the first  
front sheet, so that visible display zones with picture



- 7 -

0 portions appear as shown in Figures 5 and 6. Simultaneously  
or immediately after or before, the first picture carrying  
sheet in the first set of sheets is pulled upwards in such  
manner that visible picture segments on the strips 1b will  
5 fill in the space between the visible picture portions of  
the strips 2b, whereby the complete picture will become  
visible, see Figures 7 and 8. It appears that it is the  
upper half of the strips 2b and the upper half of the strips  
1b that become visible, or in other words, the picture on  
10 the picture carrying sheet of the first set (behind the first  
front sheet) must be displaced by the half height of a strip  
downwards relative to the picture on the picture carrying  
sheet with the strips 2b in the second set of sheets (behind  
the second front sheet).

15 It will be obvious that the openings 4, 5, which  
behind the first set of sheets extend upwards from the cut-  
ting lines 3 and in the second set of sheets extend downwards  
from the cutting lines 3, may have other shapes than that  
shown, of an isosceles triangle. Further, it will be obvious  
20 that the openings in the foremost set of sheets might point  
downwards from the cutting lines and in the rearmost set of  
sheets might point upwards from the cutting lines, whereby  
the strips in the rearmost set of sheets will extend down-  
wardly, and the displacement of the picture carrying sheets  
25 will be carried out in a downward direction. However, when  
a picture is illuminated by light from above, which most  
frequently will be the case, it is preferable that the  
cassette is constructed as shown in the drawing, because  
shadows from the free horizontal edges of the strips hereby  
30 may be avoided.

Further, if desired, the sheets may be placed in  
an arbitrary oblique position or lying horizontally or  
with both side edges horizontally, but in the same vertical  
or slanting plane and with the vertical or slanting strips  
35 being illuminated from one side.

It will be understood that by the invention a flat  
cassette has been provided, in which the sheets can be moved



- 8 -

0

so as to cyclically display a plurality of pictures as the sheets are driven upwardly and downwardly in reciprocating movements by guiding means engaging the marginal portions of the sheets.

5

10

15

20

25

30

35



- 9 -

0

Patent Claims:

1. A cassette for an apparatus having a screen for cyclical showing of a plurality of pictures, each being  
5 composed of picture segments on at least two groups of horizontal strips (1b, 2b; 1c, 2c), the strips in each individual group being made in one continuous sheet and being separated from one another by horizontal cutting lines (3) extending between two marginal portions of the sheet, and  
10 the various sheets being placed upon each other in such manner that the strips carrying the picture segments are gathered in a number of piles equal to the number of strips in each sheet, and the number of strips in each pile being equal to the number of picture forming groups, and each  
15 single sheet - with the group of strips formed therein - being displaceable in the plane relative to the other sheets, i.e. relative to the other strips in the piles, in such manner that the picture segments (1b or 1c) on them become visible and together with picture segments (2b or 2c) on at  
20 least one more displaced group of strips in another sheet form a continuous picture, c h a r a c t e r i z e d in that the cutting lines (3) between the strips (1b resp. 1c) in a picture forming group in a first sheet at the marginal portions join openings (4) which are all pointing away from  
25 the cutting line (3) in the same vertical direction, and that the cutting lines (3) between the strips (2b resp. 2c) in a second picture forming group for the obtaining of the same picture all at their ends in the marginal portions join openings (5) pointing away from the cutting line in a  
30 direction opposite to the direction of the first-mentioned openings (4).

2. A cassette according to claim 1, c h a r a c t e r i z e d in that the strips (1b, 2b) in those groups that together are forming a complete picture are arranged  
35 in only two sheets, each of which is carrying a complete picture on the group of picture carrying strips formed in the sheet.



- 10 -

0

3. A cassette according to claims 1-2, c h a r -  
a c t e r i z e d in that the openings (4, 5) at the ends  
of the horizontal cutting lines (3) are isosceles triangles  
having their bases situated on the cutting lines.

5

4. A cassette according to claims 1-3, c h a r -  
a c t e r i z e d in that the sheets (1b, 1c resp. 2b, 2c)  
cooperating in pairs and carrying the same picture are  
arranged each within their own set of sheets, and that the  
openings (4) in all the sheets (1b, 1c) in one set are  
10 pointing in opposite direction of the openings (5) in all  
the sheets (2b, 2c) in the other set.

15

5. A cassette according to claim 4, c h a r -  
a c t e r i z e d in that in front of the sheets of each  
set of sheets is placed a preferably picture-less front  
sheet (1) adapted to be secured stationary in the adverti-  
sing apparatus, and that the strips (2a) in the rearmost  
front sheet have been carried up between the strips (1a)  
in the foremost front sheet and are lying upon these  
strips.

20

6. A cassette according to claim 5, c h a r a c t -  
e r i z e d in that the sheets with the picture forming  
strips (1b, 1c; 2b, 2c) in their marginal portions have  
means (6) for coupling of the sheets to vertically recipro-  
cating moving mechanisms.

25

7. An apparatus for displaying pictures in a  
cassette according to claims 1-6 and having a display screen  
and holding and guiding means for vertical displacement of  
picture carrying strips relative to each other, c h a r -  
a c t e r i z e d in that the guiding means comprise gripp-  
30 ing members adapted to engage lateral sections of each of  
the sheets with picture carrying strips in a cassette.

35



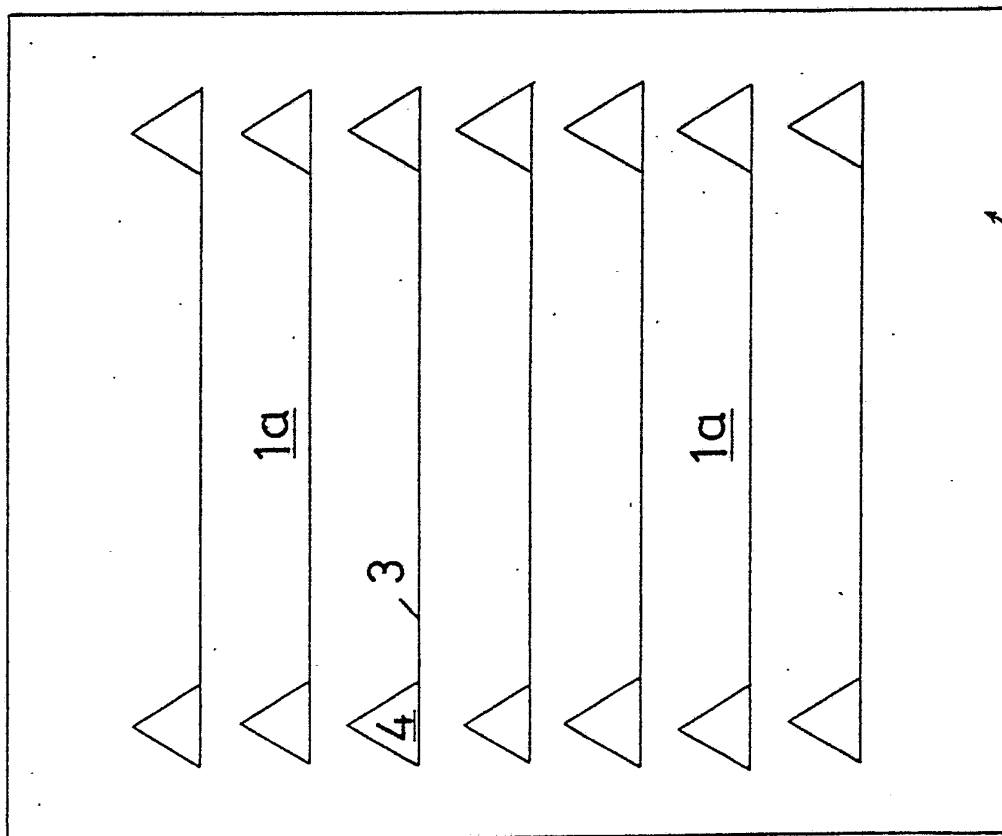


Fig 1

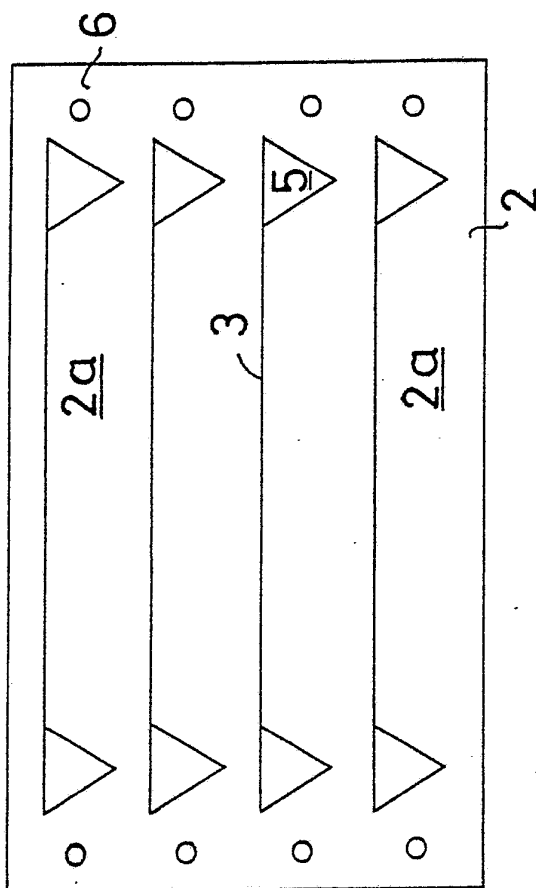


Fig 2

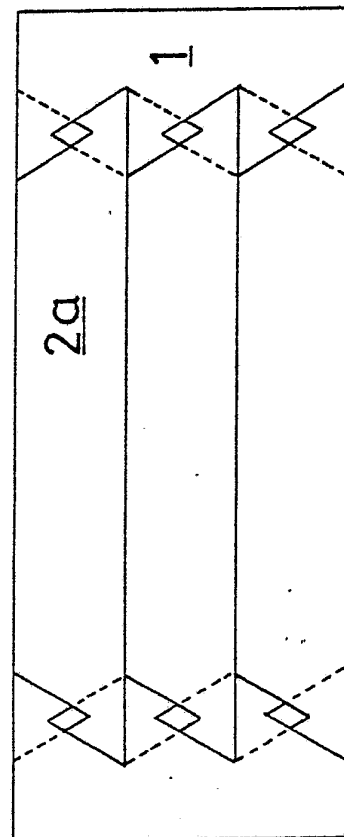


Fig 3

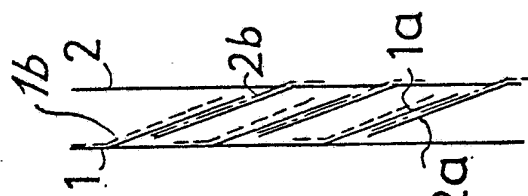


Fig 4

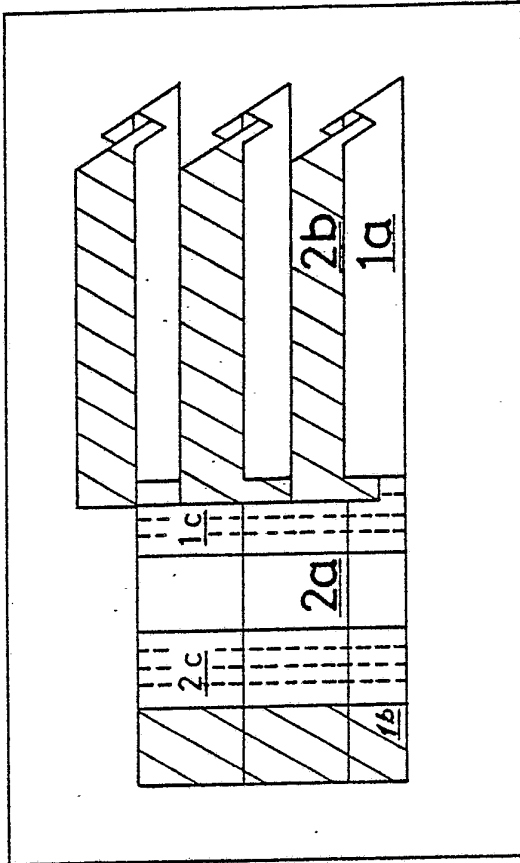


Fig. 6

2

Fig. 8

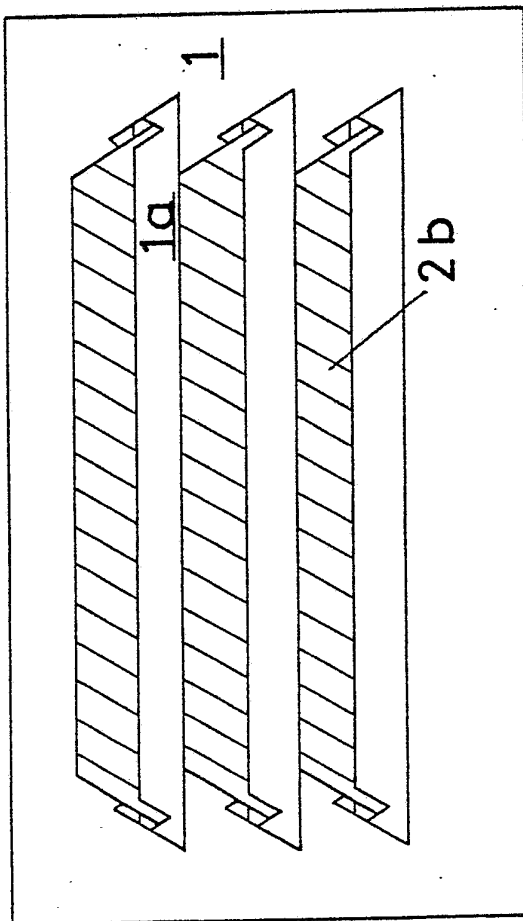
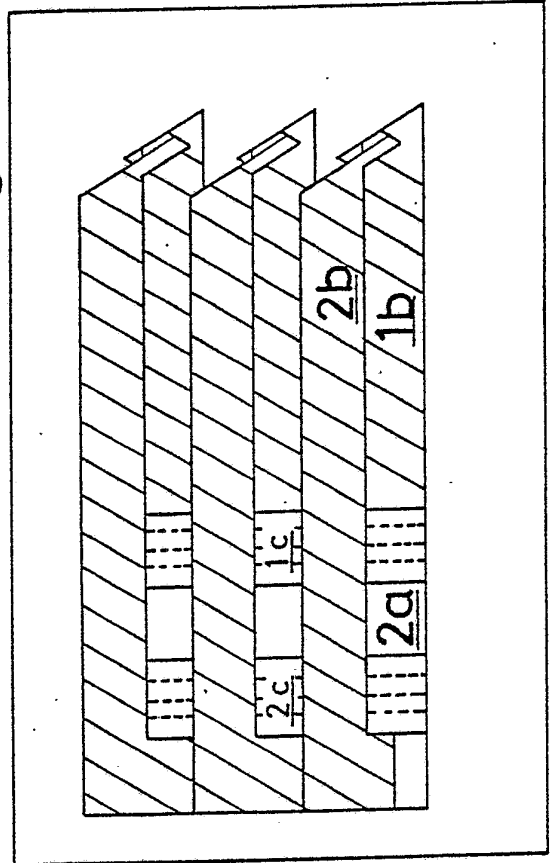
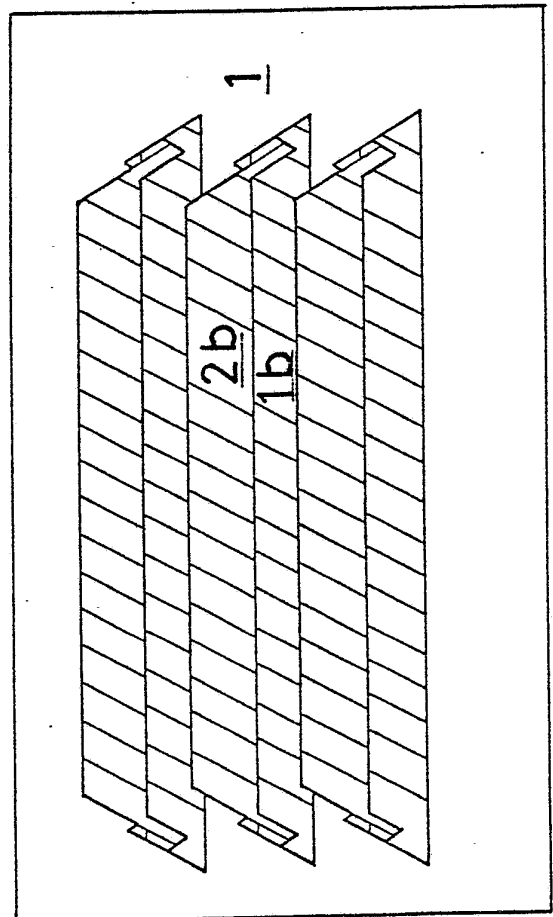


Fig. 5

Fig. 7



# INTERNATIONAL SEARCH REPORT

International Application No PCT/DK83/00004

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>3</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC <span style="float: right;">3</span>		
G 09 F 11/30		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>4</sup>		
Classification System	Classification Symbols	
IPC 3 National Cl US Cl	G 09 F 11/00, 06, 30 54g:4/01; 54h:2/02 40:36, 65	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>5</sup>		
SE, NO, DK, FI classes as above		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <sup>14</sup>		
Category <sup>6</sup>	Citation of Document, <sup>15</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>14</sup>
X	US, A, 3 659 367 (YUMOTO) 2 May 1972	1-7
X	US, A, 3 421 240 (BARDI) 14 January 1969	1-7
X	US, A, 3 403 465 (LANE) 1 October 1968	1-7
X	US, A, 3 080 668 (REALI) 12 March 1963	1-7
A	US, A, 2 141 398 (LOEWENSTEIN) 27 December 1938	1-7
A	NO, B, 126 406 (MULTIMATIC DISPLAYS INC) 29 January 1973	1-7
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><sup>*</sup> Special categories of cited documents: <sup>18</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"Z" document member of the same patent family</p> </div> </div>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search <sup>1</sup>		Date of Mailing of this International Search Report <sup>1</sup>
1983-03-30		1983-04-11
International Searching Authority <sup>1</sup>		Signature of Authorized Officer <sup>19</sup>
Swedish Patent Office		Manfred Weiss