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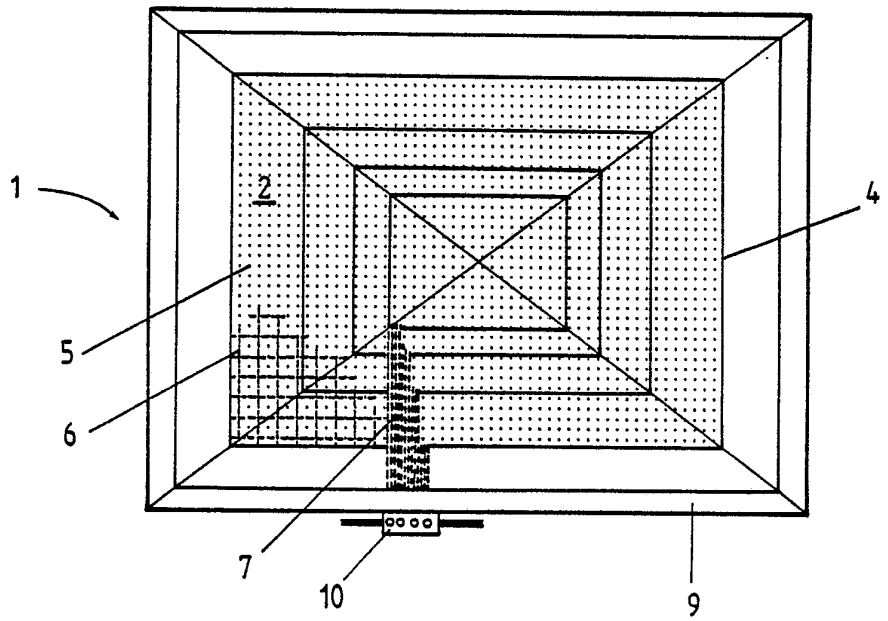

(57) Abstract

A vacuum-operated holder board (1) for example to secure light-sensitive material to a process camera, which consists of a perforated faceboard (2) and a baseboard (3) and between these sheets separately delimited suction areas, from which the areas remaining beneath the sheet are brought into operation by connecting them through extract channels (7) to a vacuum source. In a holder board (1) in accordance with the invention the suction areas are formed between close surfaces by delimiting and dividing them from one another by a glue joint (4), sealing strip or mastic, and collector channels (6), which in the same way as the extract channels (7) are formed of channels cut into the faceboard (2), are used to improve the air flow. In the adaptation intended for a process camera it is advantageous if the baseboard (3) is transparent, e.g. a ground glass sheet, and the faceboard's (2) acrylic sheet's (8) surface is roughened, and it has a scale base. The same holder board (1) then acts as a normal film cassette for process cameras, as a projection surface, and as a matt-glass focussing glass.

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A Vacuum-operated Holder Board

The present invention concerns a vacuum-operated holder board to be used for example to secure light-sensitive material to a process camera or as a layout light-table, and which consists of a perforated face-board, a baseboard, and between them separately delimited suction areas, an appropriate area of which to remain beneath the sheet or similar being secured to the board is brought into operation by connecting them through extract channels to the vacuum system.

In most process cameras the film casette is in a vertical position in a fixed place. In connexion with the film casette there is a separate projection surface for large pictures, and a matt focussing glass. All of these are generally hinged in order that each in turn can be turned into the line of the light image. How accurately the light-sensitive material, for example the film, and the matt focussing glass lie at the same distance from the lens, depends on teh accuracy of the precision engineering of the apparatus.

U.K. and U.S.A. patent publications numbers GB 1453 953, and U.S. 3308,714, 3551,048, and 3762,815 present holders that are characterized by mechanical solutions close to this invention. In the board in accordance with the U.K. publication three or more sheets, which are placed on top of one another, are used. Typically a fourth board must be used in addition to the first three, in order to achieve strength and straightness in the glass sheets. The use of the three glass sheet construction is difficult, because each one of the sheets must be machined. On the other hand even a three-glass construction is not suitable as the base for a focussing surface i.e. matt glass. This use is ruled out by the three-sheet construction being too thick for the sharpness of the image to be able to be estimated with an eyeglass, for example to the degree of accuracy required in map photography. In the boards in accordance with the U.S.A. publications the film is secured to the surface of a perforated sheet, under which there are cell-like suction channels, which are formed between the faceboard and the baseboard. The vacuum between the boards may draw the faceboard and the film beneath it into a curve, especially in the holder present in the last publication. In

the holder described in U.S.A. publications 3308,714 and 3551,048 there are dividing walls used between the boards, which divide the suction areas into parts, and form flow channels between the boards.

The field of the invention also includes a light-table apparatus. The production of an offset printing plate takes place as contact copying so that the transparent pictures, e.g. a positive film, secured to the folio, are pressed against the offset printing plate and lit through the folio. Layout work is commenced so that the folio, on top of which a little glue is spread to hold the film material onto it, is first placed onto the light-table. The spread glue hinders layout, which in addition must be carried out in mirror image, for the emulsion surface must be directly against the offset plate.

It is the intention of this invention to achieve a holder board of the type described in the introduction to Patent Claim 1, which is of simple construction, and retains its level surface regardless of the vacuum between the boards. What is presented in the part of Patent Claim 1 dealing with the characteristics of the invention is that which is principally characteristic of it.

The form of realization in accordance with Patent Claim 2 makes it possible to form all the flow channels with the aid of the faceboard, in which case the baseboard can be completely flat, and does not require holes.

As applied to a process camera the holder board is best realized as in accordance with Patent Claims 4 and 5. As the basic structure the combination of glass-sheet - acrylic sheet is mechanically sturdy, and the distance of the sheets from one another being typically c. 0,01 mm the faceboard is scarcely permitted to bend. Due to the suction the distance dimimishes, and may disappear altogether. The roughened surface of the acrylis sheet acts to advantage as a projection surface at precisely the point where the light-sensitive material is lit, and in such a way that the focussed image is of the same dimensions as the lit image. The transparent baeboard makes it possible to also examine the image from the rear. A scale network and possible millimetre background make it easy to achieve a precise enlargement ratio. By examining the reflected image with the aid of a magnifying glass from the rear it is

possible to correct an enlargement to an accuracy of a tenth of a millimetre at a distance of one metre. The holder board also acts advantageously simultaneously as a film casette, projection surface, and matt focussing glass.

When adapting the holder board to light-table use the form of realization in accordance with Patent Claim 6 is possible. According to it the holder board can be installed later as a light accessory to an existing light-table. A holder board in accordance with the invention is extremely advantageous in light-table use when positive or negative films are layed out for contact copying. When using a holder board in accordance with the invention the preparation of offset printing film layour takes place in the reverse order to that according to the technical level. The picture can be layed out on the holder board as such, because the suction retains it. As the emulsion surface remains against the board it is seen right way round, and only after layour is the glue spread on the pictures and the folio pressed against them, aften which the vacuum is switched off, and the layed-out pictures attached to the folio are ready for contact copying onto an offset printing plate.

In what follows the invention is described with reference to the accompanying illustrations, which present one adaption of the invention intended to secure light-sensitive material to a projection surface for a process camera.

Figure 1. FRont view of the hoder board.

Figure 2. Cross-section, side view of the holder board.

Figure 3. One form of the installation of the holder board in a process camera.

Figure 4. Partial cross-section of another form of installation.

The holder board 1 is used for all sizes of sheets and films, and they are secured to the surface 8 by the effect of suction. The suction area is delimited and divided into different parts by means of the glue joint 4. Sealing strip, mastic, or tape can also be used for this purpose. The separate suction areas correspond to desired sizes, and they are brought into use with the aid of the valve device 10, which may be of

the type described in the publication US 3551,048. The holder board 1 also acts as a matt focussing glass in such a way that by means of the roughening of the surface 8 and the scale base, the reflected image is focussed using the same surface 8 to which the film or sheet is secured, Figure 1.

The structure of the holder board is thin. The acrylic sheet 2 and ground glass sheet 3 nearly touch one another. The suction channels are principally formed by the channels 6 cut in the acrylic sheet 2. The acrylic sheet 2 is perforated throughout, except for the area of the extract channels 7. The lack of perforation in a small area of the foot of the sheet has been found to have no practical significance.

The holes 5 channel the suction to the surface 8. Some of the holes 5 are over the channels 6, some between them. The space between sheets 2 and 3, which is even less than 0,01 mm, is nevertheless sufficient to direct the vacuum flow from hole 5 to channel 6. The suction finally draws sheets 2 and 3 tightly to each other locally, but before this the holes 5 between the channels 6 have been exhausted to form a vacuum.

The holder board is constructed on a frame 9, Figure 2. In this the thickness of the sheets has been exaggerated. The thickness of the sheets is typically 5...10 mm. The apparatus includes a vacuum pump as the source of suction. The roller blind 11 is required to avoid diffuse reflections during lighting. It is fundamental that the extract channels 7 and the suction flow collectors 6 are formed in the main from the channels made in the acrylic sheet, and only a small part of the suction flow travels through the narrow gap between sheets 2 and 3.

In addition in Figure 3 the holder board 1 is depicted as adapted in connexion with a process camera. The holder board 1 is in a darkroom to which the image is reflected through an opening in the wall, on the other side of which is a lens 12 with a bellows protected adjustment mechanism. The holder board 1 can be moved along the guides 13.

The production of a copy using the holder board 1 takes place as follows: the image is reflected onto surface 8 and focussed precisely and to the right size from the rear with the aid of the scale base on that side. When the safety lamp is lit the light-sensitive material, e.g. an A4 sheet, is placed in the correct position according to the

scale base, the vacuum pump is started and only an A4-sized area is connected by means of the valve device 10. The picture is exposed and the vacuum pump stopped, when the exposed sheet is removed from the board and can be developed using normal procedures.

In Figure 4 another possible method of delimiting the suction areas is shown. Limit channels 15 are machined onto surface sheet 2, and these are filled with transparent silicon mastic. This is pressed completely into the grooves as sheets 2 and 3 are pulled onto one another as a result of the suction.

Claims

1. A vacuum-operated holder board (1) e.g. for securing light-sensitive material to a process camera, or for a light-table, which consists of a perforated faceboard (2) and a baseboard (3), and between these sheets, separate delimited suction areas, of which those that lie beneath a sheet or similar to be attached to the board are brought into operation by connecting them by means of extract channels (7) to a vacuum system, characterized in that the suction areas are formed between close surfaces (2,3) by delimiting them and separating them from one another by a glue joint (4), or by placing transparent or translucent sealing strip or mastic into the groove, and that in order to improve the airflow the surface sheet (2) includes collector channels (6) formed of grooves at the position of most of the holes, and that the extract channels (7) are formed between the sheets on the surface of one or other of the sheets.

2. A holder board (1) in accordance with Claim 1, characterized in that the extract channels (7) are also formed of channels cut in the faceboard (2).

3. A holder board (1) in accordance with Claims 1 or 2, in which the faceboard (2) is of acrylic sheet or other plastic, characterized in that the perforation of the faceboard (2) is dense and covers the entire suction area except for the positions of the extract channels (7) and that the individual holes (5) are small, of a diameter of less than 1,0 mm.

4. A holder board (1) in accordance with Claims 1,2, or 3, which is intended to secure light-sensitive material to a process camera or similar, characterized in that the baseboard (3) is a ground glass sheet.

5. A holder board (1) in accordance with Claims 1,2,3, or 4, characterized in that the perforation of the faceboard (2) forms a centimetre or similar scale network, either alone or with a scale outline realized on the surface (8), e.g. a millimetre base.

6. A holder board (1) in accordance with Claims 2 or 3, which is intended as a light-table, characterized in that the opal glass or similar of the light-table is used as the baseboard (3).

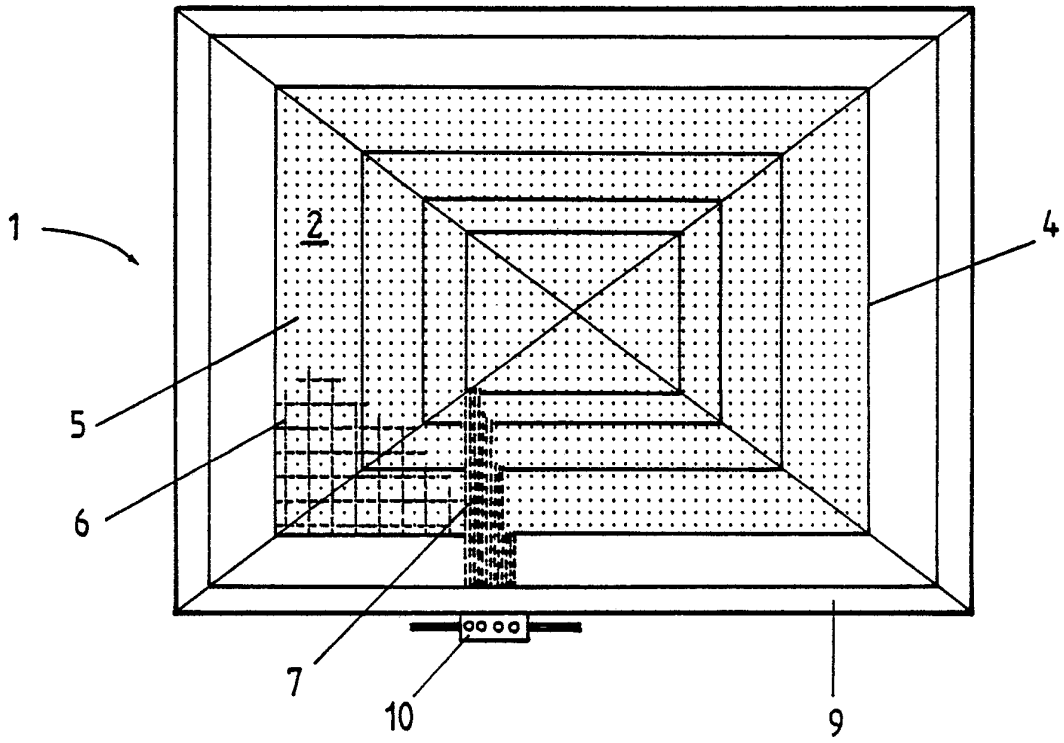

Fig 1.

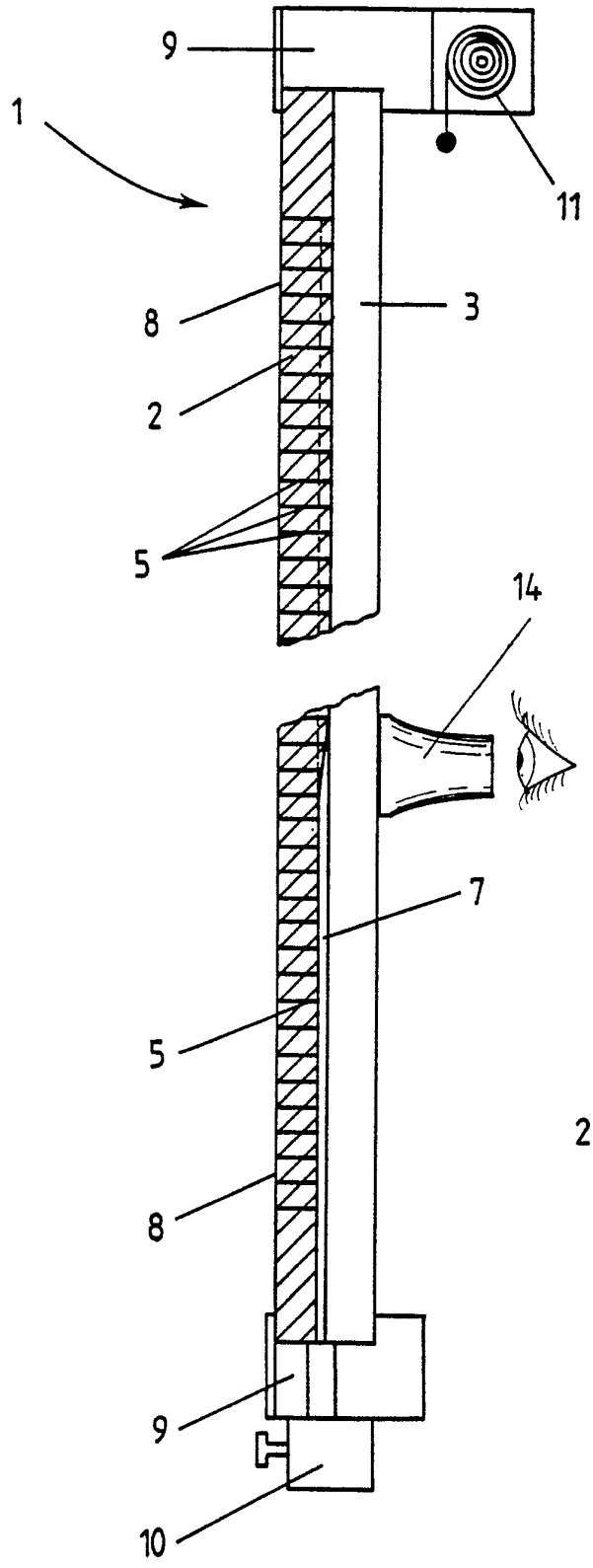

Fig 2.

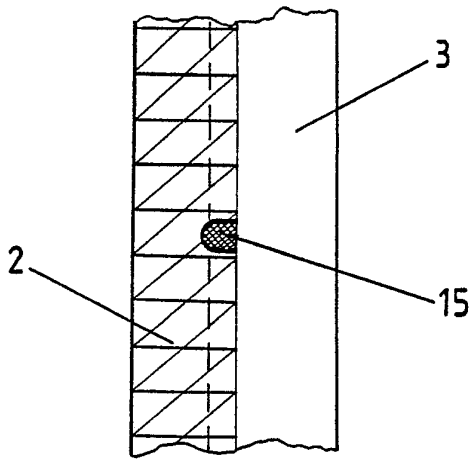

Fig. 4

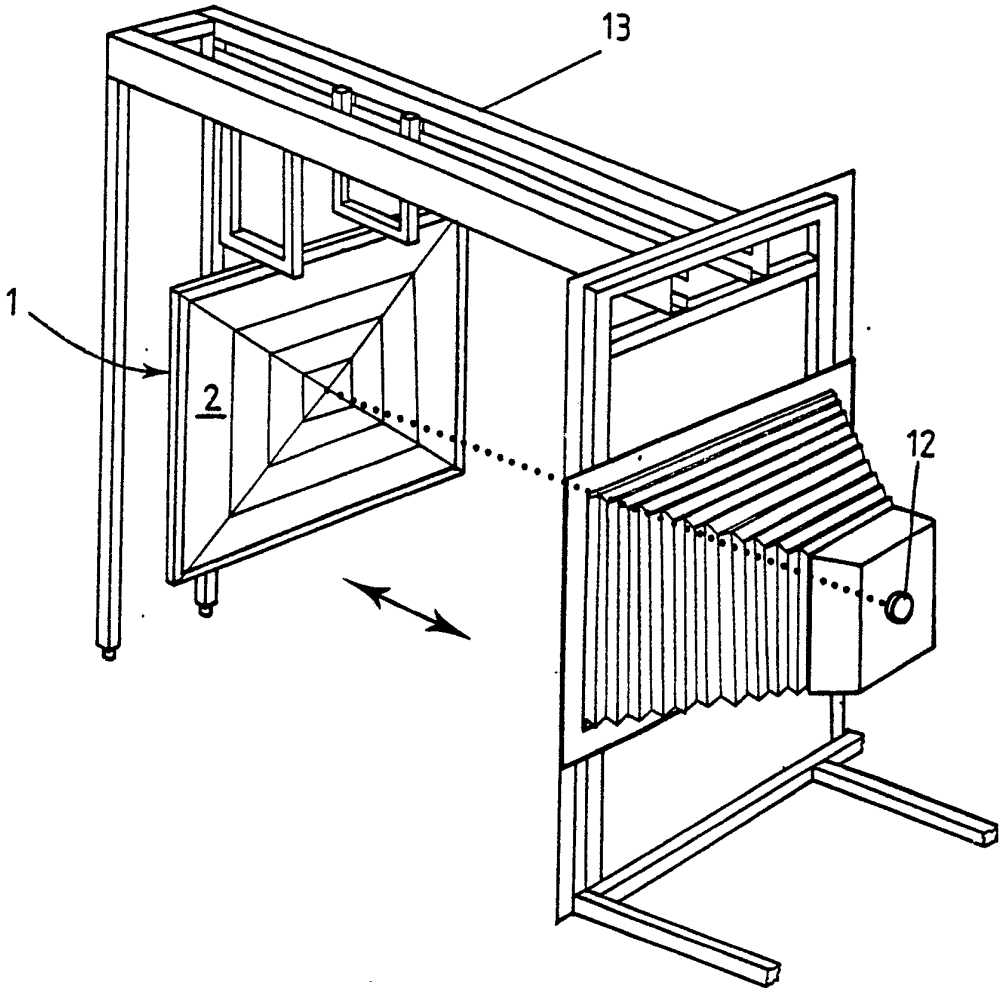

Fig 3.

INTERNATIONAL SEARCH REPORT

International Application No PCT/FI87/00008

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC 4

G 03 B 27/60

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC 4	G 03 B 27/18, /20, /22, /32, /52, /56, /58, /60, /62, /64
US Cl	355:18, 67, 72-77

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
A	DE, B2, 1 146 742 (LEATHLEY PUBLICATIONS LTD) 4 April 1963	
A	DE, C2, 2 950 080 (KLIMSCH & CO) 31 January 1985	
A	DE, A1, 3 220 009 (J TIEFEL) 1 December 1983	
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