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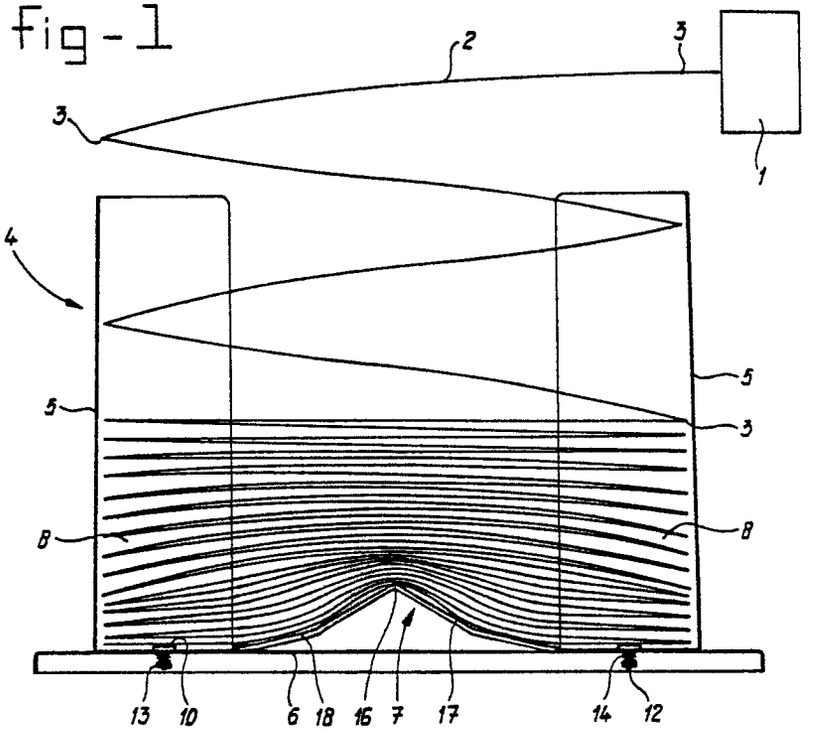
(54) Device for forming a stack of a zigzag folded web.

(57) In order to ensure correct stacking of a downward-moving web and prevent it from folding double in the wrong way or sticking when it comes down on the bottom provided for it, provision is made for a support which extends from the bottom upwards, and the top of which has a sharp point (16).

Fig-1



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Device for forming a stack of a zigzag folded web.

The present invention relates to a device for forming a stack of a zigzag folded web, comprising an upward support approximately in the centre.

Such a device is known from DE-A-2549165, which describes a support of which in the position of use the top is rounded. This produces the real danger that the front edge of a web of material is going to hit this top in the centre and stick there without moving to one of the sides of the support. The result is that the web can fold double at that point through the weight of the web exerted on the front end thereof. It is also possible that at further loading the end of the web of material will move only partially to one side. If the web is provided with weakening lines along which it must be folded, the position of these weakening lines no longer corresponds to the boundary of the desired stack, so that stacking is either very untidy or does not take place at all, and these is random piling up of the web of material.

The object of the present invention is to avoid this disadvantage.

This object is achieved in a device of the type described above in that the top of the support comprises a sharp point. This means that when a web of material comes down to one of the sides, its end is forced to move beside this point, so that the above-described problems do not occur. Indeed, the effect described does not apply to the end of the web of material alone, but there is a risk of any folded part which comes down being incorrectly positioned, and this is now eliminated by the invention.

In order to guide the web of material further, according to an advantageous embodiment, the point of the support is adjoined by a part with a relatively steep incline, followed by a part connected to the flat bottom with a comparatively less steep incline. This succession of inclines also provides for almost automatic folding of the web of material. This means that, on the one hand, much better stacking is obtained and, on the other, less stringent standards are required for the weakening lines for the subsequent folds, so that the web of material is not weakened as much there.

According to another advantageous embodiment, the above-described device comprises at least two opposite side walls, the distance between the side walls being essentially equal to the distance between two folds of the web. It has been found that if the individual parts of a web of material are precisely confined, a very even stack is obtained. In order to prevent a web of material from moving over the side walls, the height of at least one of those side walls is made at least the same size as the distance between the two side walls. If a very large stack has to be stored in the tray, the side walls can be provided with means for fitting extensions. The neat stacking is also improved by at least one of the side walls forming an angle of slightly less than 90 degrees with the bottom part and sloping towards the other side wall.

For adaptation to the different sizes of paper, at least one of the side walls can be made adjustable relative to the bottom part. In order to prevent the web of folded material from being stacked in uncontrolled fashion transversely to the direction of movement, there can be further walls which are at right angles to the bottom part and connect the side walls. They can be partially interrupted, which makes it possible to take hold of a stack of folded web material by hand.

For obtaining the correct stack in a simple manner, it is also possible to have means for controlling movement of the web of material. Said means can comprise yielding elements hanging down on either side symmetrically relative to the centre. A tray designed in such a way is in particular suitable for the accommodation of a web of computer paper which is folded to sheets along a perforation.

The invention will be explained in greater detail below with reference to the examples of embodiments shown in the drawings, in which:

Fig. 1 shows a cutaway tray provided with a web of paper disposed near a printer.

Fig. 2 shows the tray of Fig. 1 empty and partially cut away, and Fig. 2a shows a detail; and

Fig. 3 shows a tray provided with web-controlling means.

Fig. 1 shows schematically and not illustrated in detail a printer 1, from which a paper web 2 is emerging.

The paper web is provided with perforations 3. This paper web is meant to fold along these perforations 3 as it goes into the tray 4. In order to achieve perfect positioning of the web of paper 2 when folded, the distance between the walls 5 of the tray is made essentially equal to the distance between the fold points of the web of paper 2. For the formation of an even better stack, the side walls 5 of the tray 4 are tapered slightly upwards. This ensures precise guidance of the stack of paper. In order to prevent the folds from standing up from the centre of the folded sheets, an upward curvature 7 is provided near the bottom 6 of the tray. This upward curvature 7 has a sharp point 16 which is adjoined on either side by a face 17 with steep incline, followed by a face 18 with less steep incline.

If a paper web 2 is introduced, the sharp point 16 forces the end of the paper web coming down in the centre to move either left or right in the drawing. Due to the sharp point 16, it is impossible for the end to stay on it and cause doubling over instead of folding. The shape of faces 17, 18 causes the web of paper 2 to be moved along smoothly and folding takes place more or less automatically. For subsequent sheets less guidance is required but, since the pointed part of upward curvature or support 7 is at least partially passed on through the folded sheets, guidance is still provided.

Fig. 2 shows the tray without paper. Apart from the side walls 5, there are other wall parts 8 to prevent the paper from moving sideways. The length of the other wall parts is selected in such a way that it is possible to reach by hand into the space left between the other wall parts to lift up the stack of paper. Fig. 2, and in particular Fig. 2a, shows the adjustment mechanism for the side walls 5. This adjustment mechanism comprises a slot 9 which has various parts with larger bore. A bolt 10 comprising a thickened head part 11 and a thinner shank 12 fits into this slot 9. A nut 13 is fixed by means of threading to the bolt. A compression spring 14 and a washer 15 are also present. The spring 14 draws the head 11 downward, and in this position the side wall 5 cannot be moved. When the head is moved up, the side wall 5 can be moved, since the slot width of slot 9 is greater everywhere than the diameter of shank 12. Adjustment of the side wall(s) 5 is important because for folding in the desired way according to the invention it is important that the length of the paper web 2 between two successive folds should be essentially equal to the width of the tray.

Fig. 3 shows an exploded view of the above-described paper tray, in which means 19 are present for controlling the paper web. They comprise frames 20 to which chains 21 are attached. These frames are fixed to the top edge of the wall parts 8. The web of paper material is thereby forced to stay in the centre, but as the stack height increases the mobility of the chains 21 means that stacking of the web of material is not impeded.

Although the embodiments shown here represent a preferred embodiment, it must be understood that many modifications can be made thereto. For example, the side walls 5 can be provided with means for the extension thereof, while attachment means can also be present for attaching to a printer or the like. The tray can also be made mobile. All these modifications are within the capability of anyone who is skilled in the art.

Claims

1. Device for forming a stack of a zigzag folded web, comprising an upward support approximately in the centre, characterized in that in the position of use the top of the support has a sharp point.

2. Device according to Claim 1, characterized in that the point of the support is adjoined by a part with a relatively steep incline, followed by a part connected to the flat bottom face with a comparatively less steep incline.

3. Device according to one of the preceding claims, comprising at least two opposite side walls, the distance between the side walls being essentially equal to the distance between two folds of the web.

4. Device according to one of the preceding claims, characterized in that the height of said side walls is at least the same size as the distance between said side walls.

5. Device according to one of the preceding claims, characterized in that at least one of said walls forms an angle of slightly less than 90 degrees with the bottom part, so that it slopes towards the other side wall.

6. Device according to one of the preceding claims, characterized in that at least one of said side walls is adjustable.

7. Device according to one of the preceding claims, characterized in that the side walls are provided with means for fitting extensions.

8. Tray according to one of the preceding claims, characterized in that further walls standing perpendicular to the bottom part and connecting the side walls are present.

9. Device according to Claim 8, characterized in that at least one of said further walls is partially interrupted.

10. Device according to one of the preceding claims, comprising means for controlling the movement of the web of material.

11. Device according to Claim 10, wherein said means comprise yielding elements hanging down symmetrically on either side relative to the centre.

12. Device according to one of the preceding claims, characterized in that the web of material is a sheet of computer paper, with perforations at the point where it has to be folded.

Fig-1

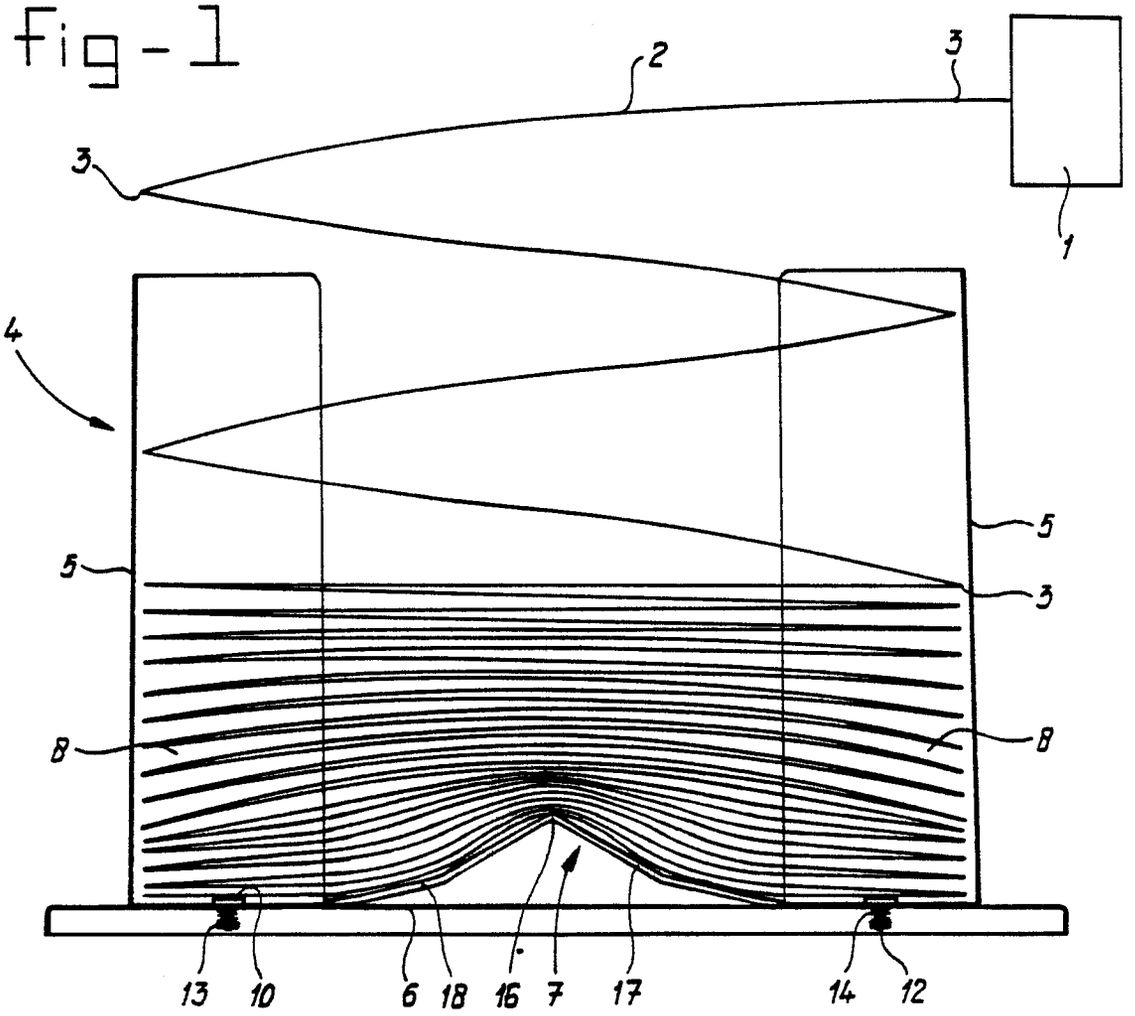

Fig-3

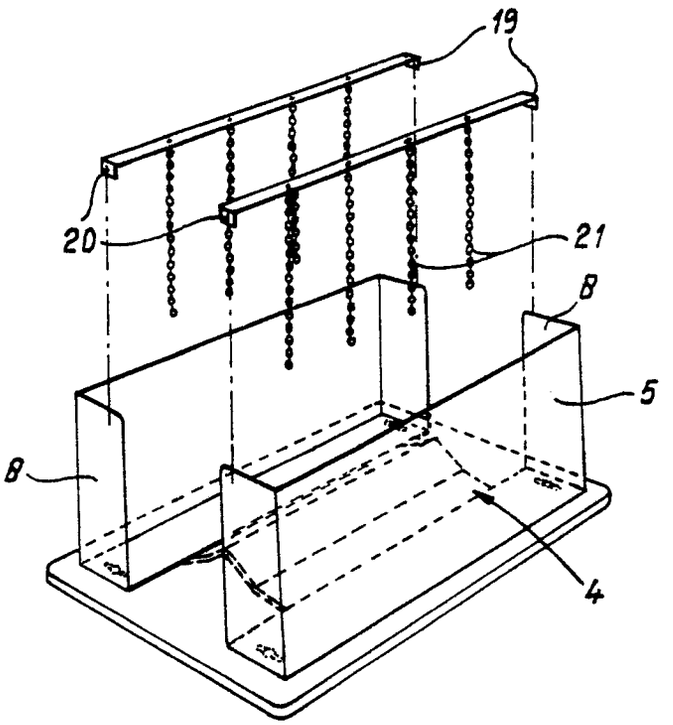

Fig-2

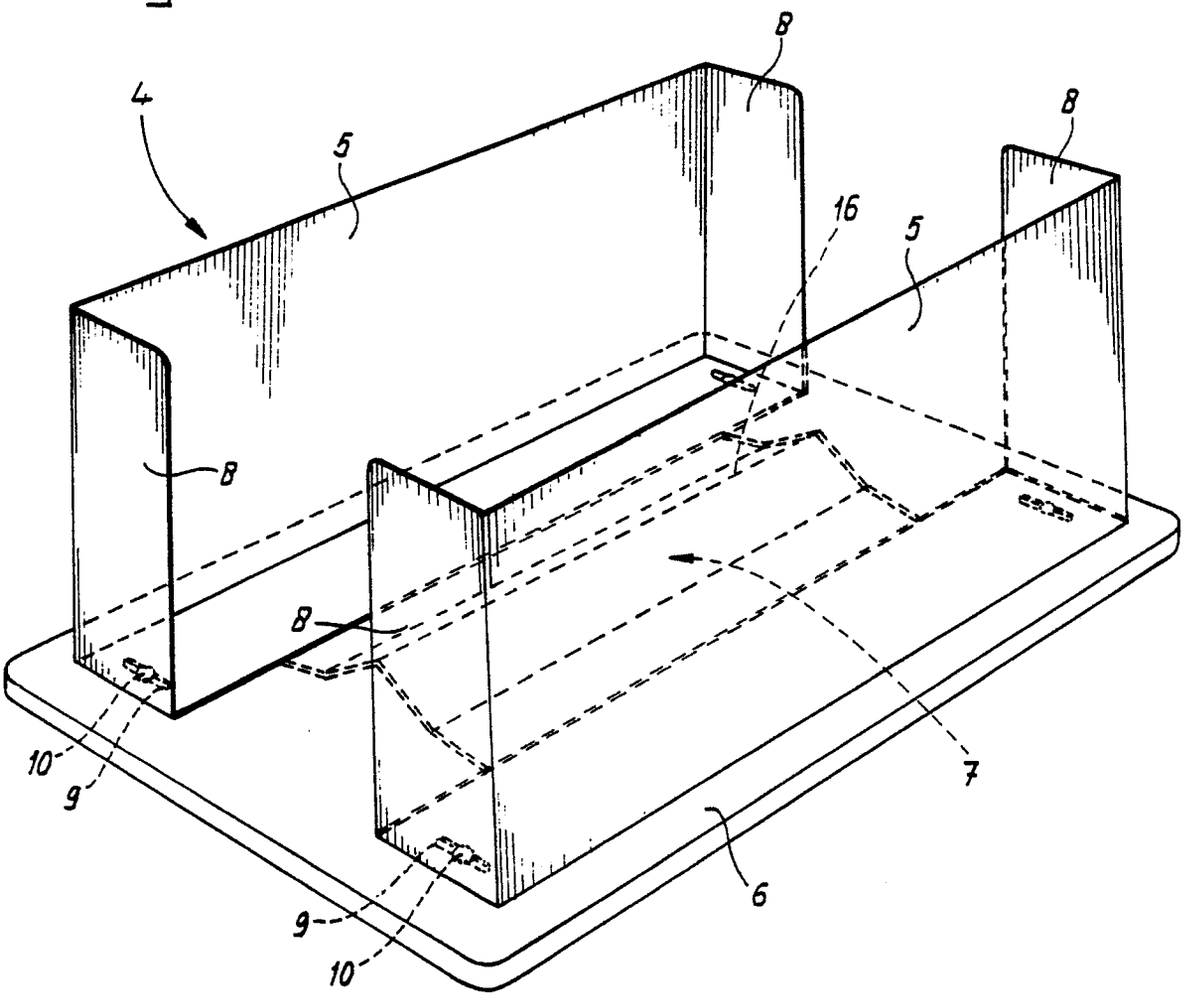

Fig-2a