Jan. 1, 1946. H. G. DENYVEN ET AL 2,392,031

SHEET ASSEMBLY DEVICE

Filed Oct. 30, 1943 3 Sheets-Sheet 1

Fig. 1.

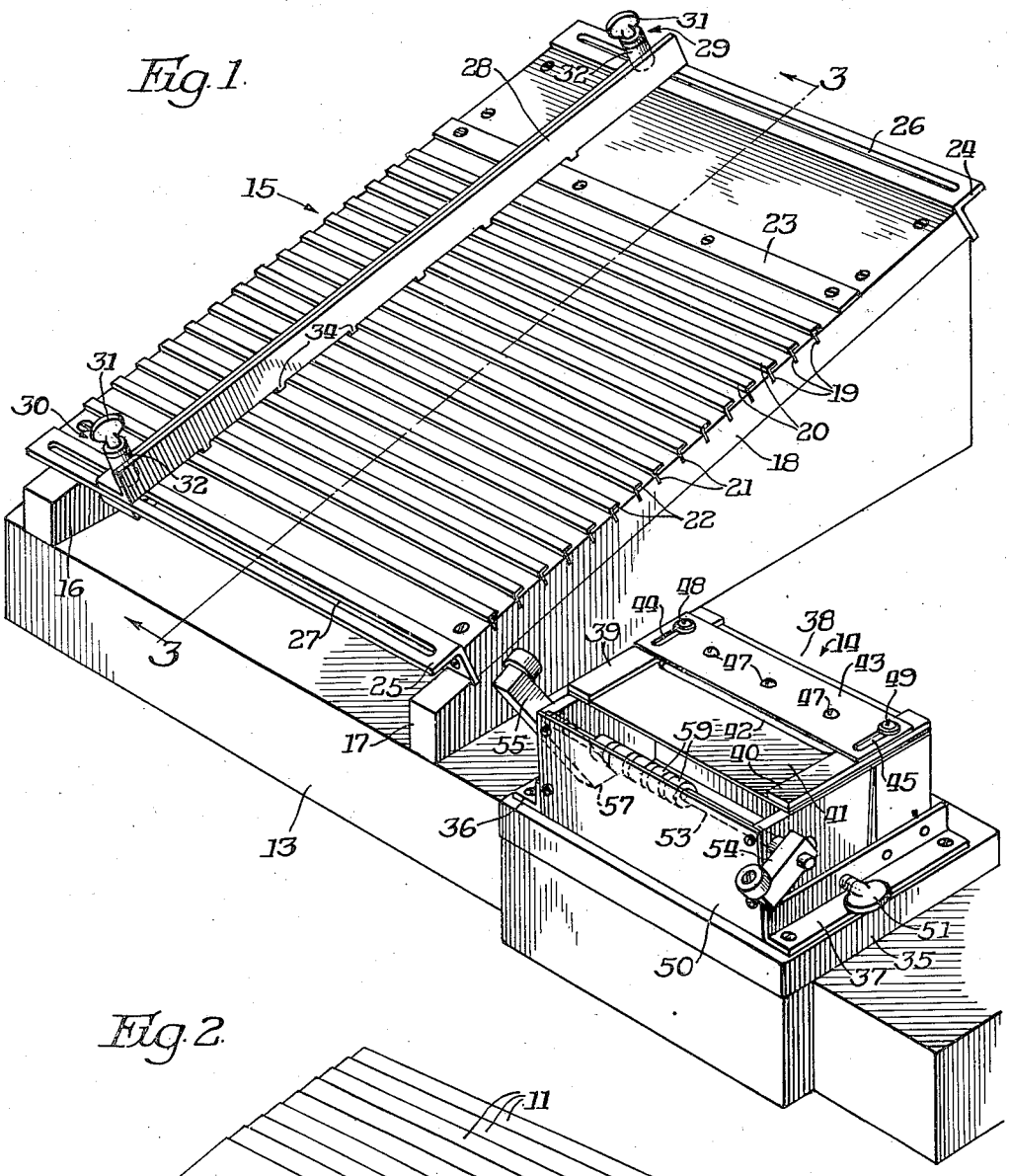
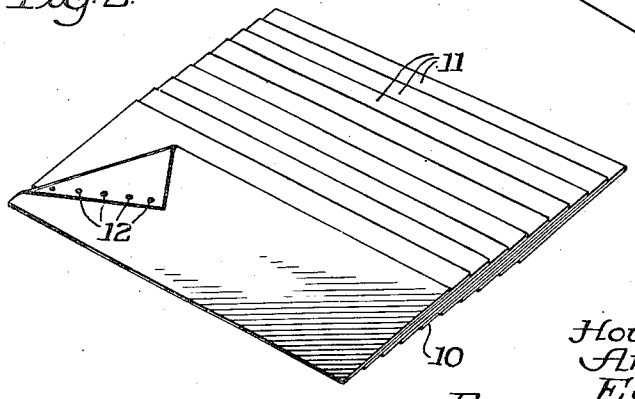


Fig. 2.



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SHEET ASSEMBLY DEVICE

Filed Oct. 30, 1943 3 Sheets-Sheet 2

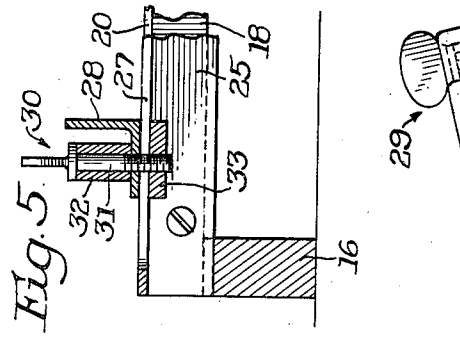


Fig. 5.

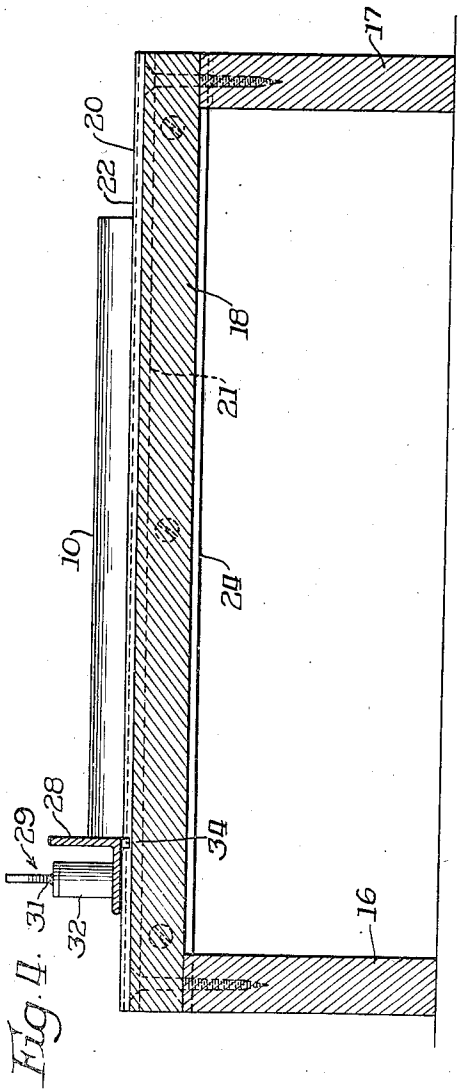


Fig. 4.

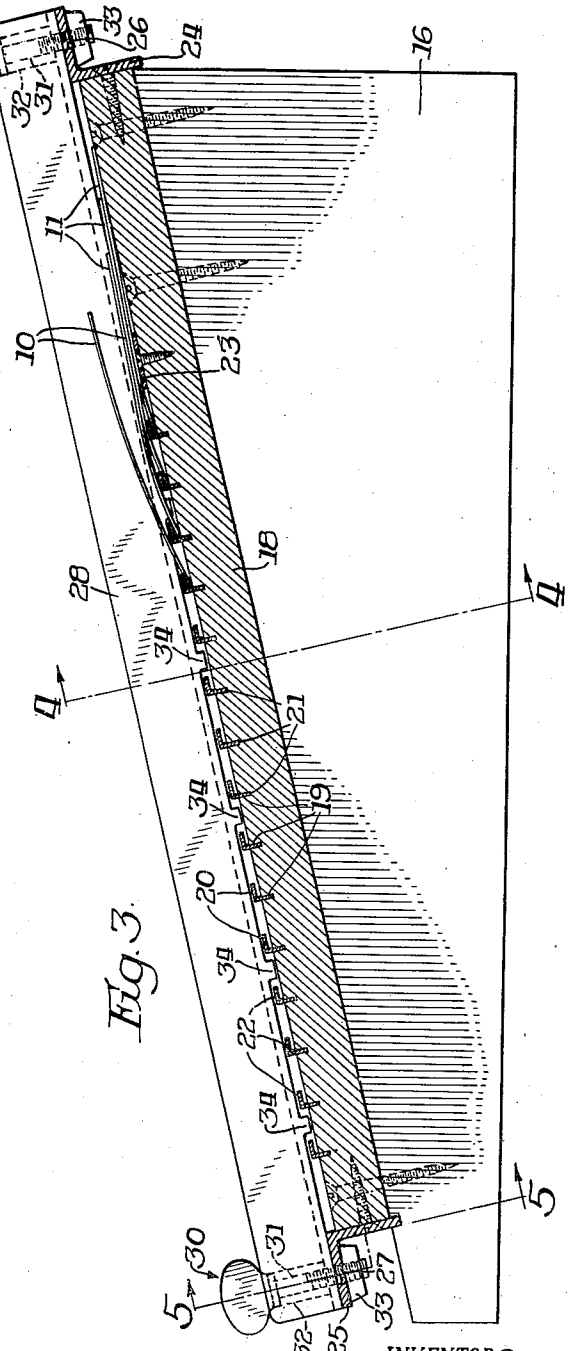


Fig. 3.

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SHEET ASSEMBLY DEVICE

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Fig. 6

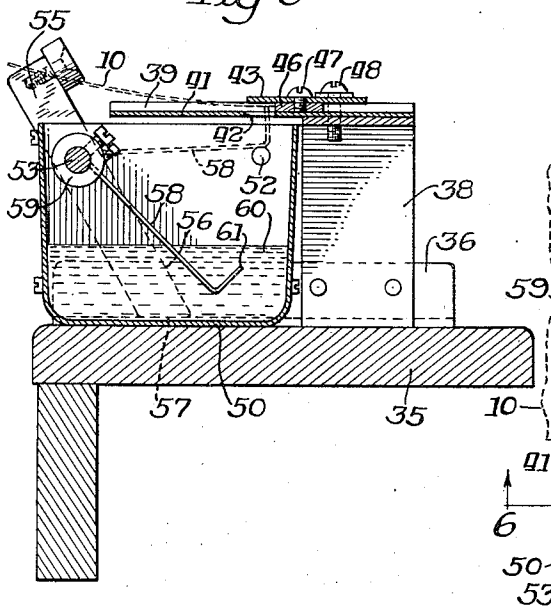


Fig. 7.

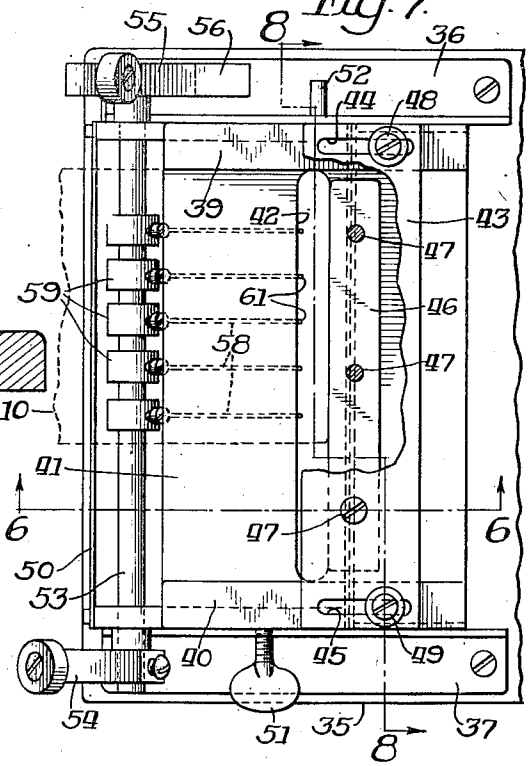
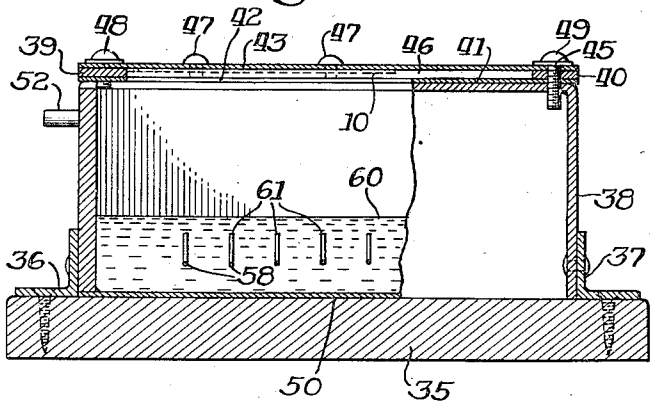


Fig. 8.



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UNITED STATES PATENT OFFICE

2,392,031

SHEET ASSEMBLY DEVICE

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Application October 30, 1943, Serial No. 508,422

5 Claims. (Cl. 281—1)

The present invention relates to a sheet assembly device and has for its principal object the provision of means whereby a multiplicity of sheets can be assembled manually into overlapped relation so that each one of the sheets has a portion thereof along one edge exposed when the group is assembled. The invention contemplates means for securing the sheets together so that they may be handled as a unit for use in duplicating work where it is desired, for example, to take off on separate sheets the several lines of a single record. One application of the unit strips is in the making out of checks from a payroll sheet. The checks are printed up and the information from the payroll sheet is applied by making a master sheet and then applying this master sheet to the several checks arranged in overlapped relation.

One purpose of the present invention is to provide a novel sheet guide and holding device in combination with a glue applying mechanism adapted to apply an adhesive at spaced points along one edge of a sheet.

It is also a purpose of the invention to provide a novel sheet arranging device by means of which several sheets can be positioned in overlapped relation with uniform spacing.

The detailed purposes and advantages of the invention will appear more fully from the following description, reference being had to the accompanying drawings wherein a preferred form of the invention is shown. It should be understood however that the drawings and description are illustrative only and are not to be taken as limiting the invention except insofar as it is limited by the claims.

In the drawings:

Figure 1 is a perspective view illustrating the sheet assembly device;

Figure 2 is a perspective view of an assembled unit comprising several sheets, the edge of the top sheet being folded back to illustrate the manner in which the adhesive is applied;

Figure 3 is a sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a sectional view taken on the line 5—5 of Figure 3;

Figure 6 is a sectional view taken centrally through the adhesive applying device substantially on the line 6—6 of Figure 7;

Figure 7 is a plan view of the adhesive applying device; and

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

Referring now in detail to the drawings, the present invention comprises means for assembling a plurality of sheets 10 together in overlapped relation as shown in Figure 2 of the drawings so that each sheet has one edge 11 exposed when viewed from the top. Sheet assemblies of this type are generally referred to as unit strip assemblies and have a variety of uses in the making and keeping of records by duplicating processes such as hectograph duplicating and liquid or wet process duplicating. The advantage of the assembled units lies in the fact that they may be used together for the purpose of taking information individually to each sheet of the unit from a single master copy having thereon a line of individual information for each of the sheets. In order for the unit strip assemblies to function properly the overlapping, to provide the portions 11, must be very accurate otherwise the information will not be properly placed on each sheet when the unit assembly is brought in contact with the master copy. It is likewise essential that the several sheets be secured together with sufficient permanence to enable them to retain their overlapped position during the duplicating operation. Likewise it is essential that the sheets be readily separable after the duplicating operation so that each sheet may be used individually. The securing means which has been found to be most effective comprises small spaced spots 12 of adhesive along one side edge of each sheet or where desirable along both side edges.

For the purpose of assembling and adhering the sheets together I provide on a suitable support 13 an adhesive applying device 14 and an assembling device 15 on which the sheets are assembled in proper alignment after the adhesive is applied thereto. These two devices, although physically independent, cooperate to provide the sheet assembling mechanism necessary to make by hand sheet assemblies such as that shown in Figure 2.

Referring now to the sheet assembling device shown best in Figures 1 to 5, inclusive, this device comprises two side rails 16 and 17 which increase in depth from the front ends to the rear ends thereof. A cover plate 18 is fastened to the side rails by screws. This cover plate has a series of transversely running grooves 19 therein, the grooves being equally spaced. In each groove a bar 20 is mounted. The bars 20 have a portion 21 fitted in the groove and firmly secured therein, for example, by gluing. Also, each bar has a flange 22 extending at right angles to the portion 21 and

parallel to the plate 18 but spaced above the plate sufficiently to readily receive the side edge of a sheet between it and the plate. Immediately above the upper bar 20 a flat, thin strip 23 is mounted on the plate 18.

In order to provide an adjustable side guide for the sheets 10 the plate 18 has two angle irons 24 and 25 secured thereto, one of the angle irons being secured at the upper edge of the plate 18 and the other one being secured at the lower edge of the plate. These angle irons project slightly above the plate and are provided with slots 26 and 27 extending almost full length thereof. A side guide 28, also in the form of an angle iron, extends from one of the slots 26 to the other slot 27. The side guide is adjustable and may be clamped in any desired position along the slots 26 and 27 by suitable clamping devices 29 and 30. These clamping devices are alike and a description of one will suffice for both. An aperture is provided in the horizontal flange of the member 28. A bolt 31 is supported upon a sleeve 32 and passes through the horizontal flange of the member 28 and through the slot in the corresponding angle iron 24 or 25. The bolt threads into a block 33 beneath the horizontal flange of the associated angle iron, and has a flattened head as shown so that it can be tightened or loosened by hand. The side guide 28 is provided with a plurality of depending lugs 34 to extend down between the spaced members 20 and prevent sheets from getting caught beneath the side guide 28.

The manner in which the sheets are assembled in overlapped relation is indicated in Figure 3. The first sheet of a group has its edge stuck underneath the upper one of the members 20. The next sheet is positioned with one edge under the next lower member 20 and the sheets are stacked in this fashion until the desired number for the unit to be made have been arranged in overlapped relation. When the sheets are placed in position they are pressed down against the sheets already in place and are adhered to them by means of the spots of adhesive.

Referring now to Figures 1, 6, 7 and 8, the adhesive applying device 14 is shown as mounted on an auxiliary base 35 immediately alongside the assembly frame. This base has two angle irons 36 and 37 fastened thereon and the angle irons carry a bracket 38 which is of inverted U-shape. On the top of the bracket 38 two flat bars 39 and 40 are fastened and the two flat bars have secured thereto a sheet 41 which is provided with an elongated slot 42 about midway between its side edges. The sheet 41 may desirably be welded to the bars 39 and 40 and to the brackets 38. An edge guide for the sheets to which the adhesive is to be applied is made up of a flat strip 43 which is provided with elongated slots 44 and 45 at its opposite ends and a narrow thicker strip 46 which is fastened to the underside of the strip 43 by screws 47. Two screws 48 and 49 which pass through the slots 44 and 45 and are threaded in the bracket 38 and the bars 39 and 40 serve to adjustably secure the sheet guide in place.

An adhesive container 50 is of such size that it may slide readily between the flanges of the angle irons 36 and 37 and engage against the bracket 38. This container 50 is held in position by a set screw 51 that is threaded into the flange of the angle iron 37. The end of the container adjacent the angle iron 36 has a pin 52 projecting outwardly near its upper edge and adjacent the rear wall of the container. The container has a shaft 53 journaled therein extending between the two end walls and lying adjacent the front wall. This shaft has two hand levers 54 and 55 fixed thereon. The hand lever 55 is also a position limiting lever as it has an extension 56 that is tapered at its end as indicated at 57 so that when the shaft is in the position shown in Figure 6 the end 57 rests on the horizontal flange of the angle iron 36. When the shaft is turned counterclockwise the portion 56 engages the pin 52 to thus limit the movement of the shaft. A series of spring fingers 58 are mounted by means of adjustable collars 59 on the shaft 53. These fingers are adapted, when lowered, to dip into a quantity of adhesive 60 in the container 50 and when raised their upturned tips 61 pass through the slot 42 to engage the strip 43.

In order to apply adhesive to a sheet by means of the fingers 58 the sheet is inserted, as shown in Figure 6, between the strip 43 and the plate 41 so as to extend over the slot 42. Then one of the hand levers is pressed down to cause the fingers to engage the undersurface of the sheet. If it is desired the sheet can be reversed and adhesive can be applied to the other end in the same fashion. For many purposes, however, applying the adhesive spots 12 by means of the fingers 58 to one end edge of a sheet will provide sufficient adherence for the sheet assembly to be used as a unit. As soon as the adhesive has been applied the sheet is positioned on the plate 18 with the adhesive carrying edge against the side guide 28. Since the adhesive is applied on the underside of the sheet the bottom sheet, that is, the first one applied to the plate 18, need not have any adhesive thereon, but the second sheet, when laid over the first sheet, is pressed down so as to cause the adhesive spots to secure the two sheets together. The operator continues to apply adhesive and assemble the sheets in this fashion until he has the desired number for a group. Normally the adhesive dries fast enough that when the group is completed it can be removed without disturbing the alignment of the several sheets.

From the foregoing description it is believed that the nature and advantages of the present invention will be readily apparent to those skilled in this art.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A device for hand assembling sheets into unit strip assemblies, comprising a plate, supporting means for said plate, said plate having uniformly spaced horizontally running grooves therein and angle shaped bars having one flange fixed in said grooves and having the other flange spaced above the top surface of the plate and extending parallel to the plate, the said other flanges all extending in the same direction, the supporting means for said plate comprising two side rails which are higher at the ends toward which said other flanges extend than at the other ends whereby to cause sheets placed beneath said flanges to stay in position by their own weight.

2. A sheet assembling device of the character described, comprising a pair of spaced side rails sloping upwardly from one end to the other, a plate mounted thereon and provided with spaced bars fixed thereto and having flanges running substantially parallel to the plate to provide channels at uniformly spaced intervals on its top surface, the said channels opening in a direction parallel to the surface of the plate whereby sheets inserted in said channels in overlapped relation may be pressed down against the plate, and a

side guide supported over the plate and said bars.

3. A sheet assembling device of the character described, comprising a pair of spaced side rails sloping upwardly from one end to the other, a plate mounted thereon and provided with channels at uniformly spaced intervals on its top surface, the said channels opening in a direction parallel to the surface of the plate whereby sheets inserted in said channels in overlapped relation may be pressed down against the plate, slotted bars at the ends of said plate, and a side guide adjustably mounted on said bars.

4. A device for hand assembling sheets into unit strip assemblies, comprising a plate, supporting means for said plate, said plate having uniformly spaced horizontally running grooves therein and angle shaped bars having one flange fitted in said grooves and having the other flange spaced above the top surface of the plate, the said other flanges all extending in the same direction, a side guide, means adjustably mounting the side guide on said plate at right angles to the bars, and means on said side guide extending toward the plate between certain bars whereby to prevent sheets from wedging between the side guide and said bars.

5. A sheet assembling device of the character described, comprising a pair of spaced side rails sloping upwardly from one end to the other, a plate mounted thereon and provided with channels at uniformly spaced intervals on its top surface, the said channels opening in a direction parallel to the surface of the plate whereby sheets inserted in said channels in overlapped relation may be pressed down against the plate, slotted bars at the ends of said plate, and a side guide adjustably mounted on said bars, said side guide having depending lugs between certain of the channels to prevent wedging of sheets beneath the side guide.

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