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3,143,935

APPARATUS FOR MANUFACTURE OF INDEX GUIDES

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2 Sheets-Sheet 1

FIG 1

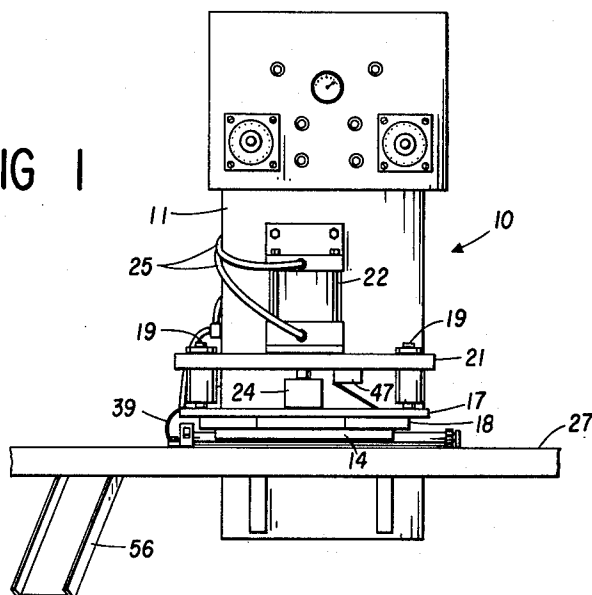
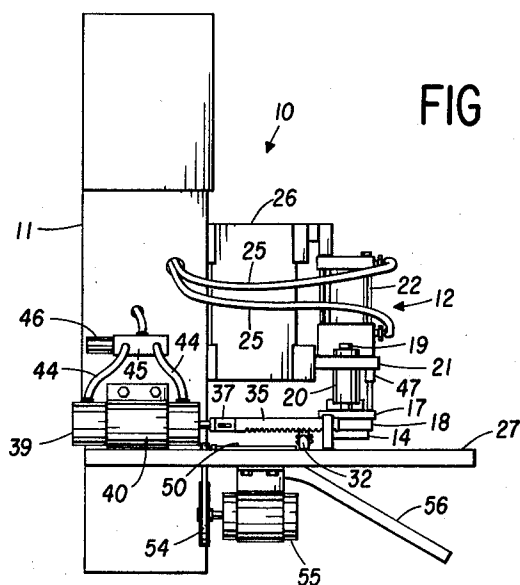


FIG 2



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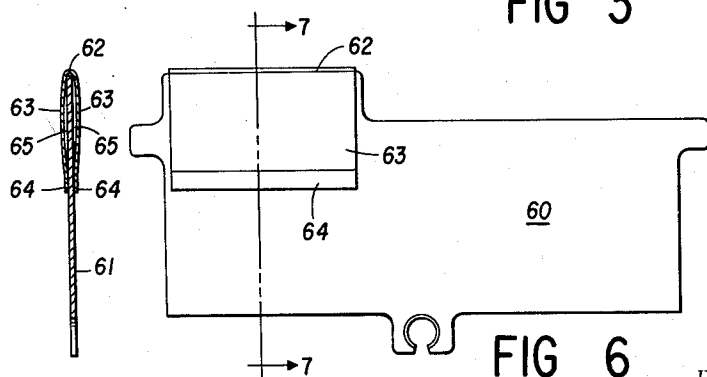
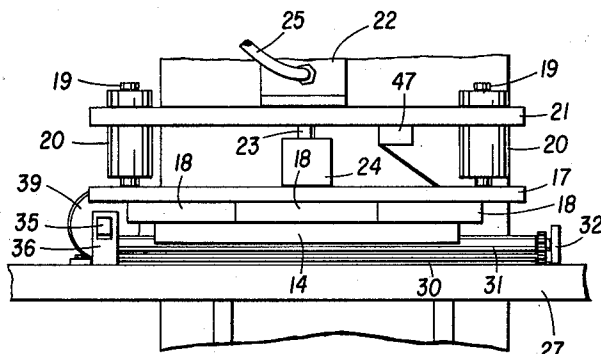
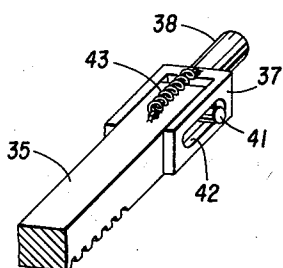
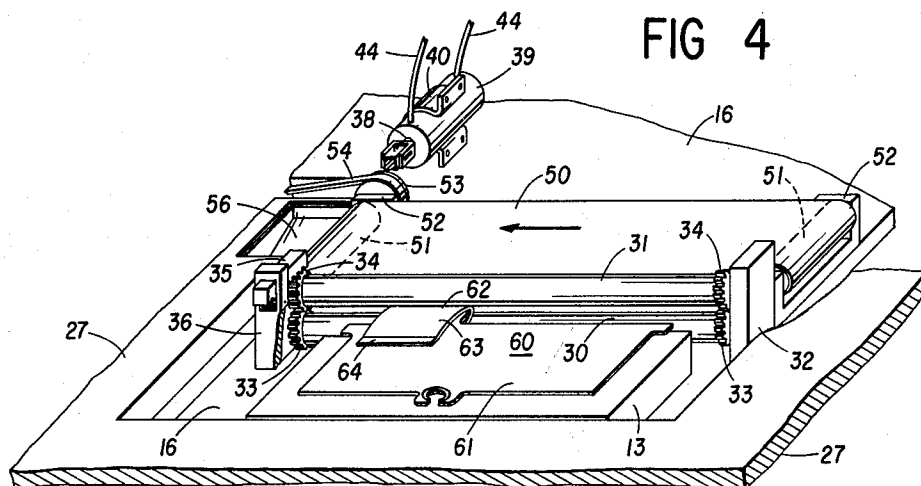
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2 Sheets-Sheet 2



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APPARATUS FOR MANUFACTURE OF INDEX GUIDES

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7 Claims. (Cl. 93—1)

This invention concerns apparatus for manufacture of index guides, and particularly machinery for the application of tab envelopes to such guides.

Index guides, used for indexing of business records, are well known and are customarily supplied with horizontal, open-ended tab envelopes secured thereto along the upper edge of the guide. The envelopes are fashioned of transparent material and are adapted to receive strips of paper or other material bearing appropriate index captions. The manufacture of the guides themselves has long been mechanized but the subsequent application thereto of the tab envelopes has largely been a manual operation. The envelope material is first pre-cut by dies to the correct shape and then folded to provide an integral, V-shaped piece having a pair of parallel leaves extending laterally from the fold. The envelope is then manually applied to the guide so that the leaves straddle its upper edge. Each leaf is thereafter secured to its respective adjacent guide face along a marginal portion of the leaf spaced inwardly from the edge of the guide, thus providing a horizontal, open-ended tab envelope on each face of the guide.

Securing of the envelope material to the guide is often accomplished nowadays by utilizing suitable plastic sheet material for the envelopes, coated on the inner faces of the marginal portions to be secured to the guide with a heat sensitive adhesive. When the guide and material are compressed between two heated members the material is annealingly secured to the respective guide faces. Another technique known as "acetate or vinyl welding" employs an electric current passing between two pressure exerting members between which is located the guide and the material to be welded thereto, the pressure members themselves not being heated. In any event, after the pre-cut folded sheet is positioned over the edge of the guide, the assembly is then manually placed between the platens of a suitable press, aligned therebetween and the press activated to compress the envelope material and the guide therebetween the proper length of time. Such presses are also well known and usually incorporate a timer mechanism which is activated upon manual activation of the press and maintains the necessary pressure, and heat or welding current, as the case may be, for the prescribed time before opening the platens. The latter are usually hydraulically operated and, when heated platens are used, electrically heated, their temperature being controlled by a thermostat. Upon opening of the press the completed guide is manually removed and the operation repeated for the next guide, and so forth.

The chief object of the present invention is to provide means for use in conjunction with the aforementioned presses which grasps the guide preparatory to its automatic removal by such means after completion of the annealing or welding operation. Briefly summarized, the preferred form of the invention provides a pair of horizontal, vertically stacked rollers having their cylindrical surfaces parallel and substantially tangent to each other and covered with a resilient material. The rollers are placed behind the platens of the press and spaced therefrom so that when the guide and envelope material are in proper location between the platens, the edge of the guide over which the envelope material is folded is grasped between the rollers. The latter are power driven

and connected into the electrical circuit of the press and its timer so that upon opening of the platens the rollers are rotated sufficiently to withdraw the finished guide from between the platens and through the rollers to the other or far side thereof. The rollers are geared together and rotated by a rack which in turn is moved to and fro by a two way hydraulic cylinder activated when a switch is tripped by the platens upon their opening movement. A continuously operating conveyor located at the other or far side of the rollers is provided to receive and carry away the finished guide. The press operator is thereby entirely freed from the heretofore manual operation required to remove each completed guide from the press preparatory to the insertion of the next.

Other and further objects, features and advantages of the invention will be apparent from the following, more detailed description of the preferred form thereof, read in conjunction with the following drawings, in which:

FIGURE 1 is a front elevational view of a typical press with the present invention applied thereto;

FIGURE 2 is a side elevation of the press of FIGURE 1;

FIGURE 3 is a fragmentary, front elevational view of the platen assembly of FIGURES 1 and 2;

FIGURE 4 is an upper perspective view of the press with the platen assembly and the cabinet removed;

FIGURE 5 is a fragmentary upper perspective view illustrating the lost motion connection between the rack and piston yoke;

FIGURE 6 is a plan view of an index guide assembly; and

FIGURE 7 is a section along the line 7—7 of FIGURE 6.

Since the invention is not directly concerned with the press itself, no extensive description thereof is needed. A typical press employing both heat and pressure and suitable for use with the present invention is manufactured by Wabash Metal Products Company, Inc., of Wabash, Indiana, and it is such a press which is basically illustrated in the drawings and referred to generally by reference numeral 10. It will be understood, of course, that the invention is equally adaptable to similar presses employing the acetate or vinyl welding technique. Essentially, the press 10 includes an upright cabinet 11 having a heavy, rigid frame (not shown) and containing the electrical and hydraulic apparatus, including a suitable timer, for activating and heating the platen assembly 12. The latter includes a pair of lower and upper platens 13 and 14, respectively, in the form of heavy, rectangular metal blocks, electrically heated, having directly opposed, horizontal plane faces co-acting to impose suitable pressure and heat therebetween. Both platens extend laterally in front of cabinet 11, the lower platen 13 being stationary and supported upon a laterally extending base plate 16 rigidly joined to the frame of cabinet 11 and forming the base of the latter. The upper, moveable platen 14 is secured to the lower horizontal face of a heavy rectangular backing plate 17 and centrally disposed with respect thereto, several heavy asbestos spacer blocks 18 being interposed therebetween to insulate plate 17 from the heat of platen 14. The upper face of plate 17 is provided with a vertical cylindrical guide post 19 at each lateral end thereof centrally disposed with respect to platen 14 along the longitudinal center line thereof. Posts 19 in turn are slideably operable in a pair of heavy, vertical guide bushings 20 disposed adjacent the respective ends of a heavy, rectangular platform 21 horizontally disposed and spaced above backing plate 17, being rigidly secured to the frame of cabinet 11. A vertically positioned, double acting pneumatic cylinder 22 is secured at its lower end to the upper face of platform 21 centrally thereof, its piston rod 23 extending slideably down

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through platform 21 and operatively connected to the upper face of backing plate 17 by means of a pillow block 24. Cylinder 22 is fitted with suitable air lines 25 connected into the compressed air supply to press 10. Accordingly, pneumatic operation of cylinder 22 will either raise or lower platen 14 and the latter will provide substantially equally distributed pressure upon platen 13 owing to the robust construction of plate 17, guide poses 19, bushings 20 and platform 21 as well as to the central disposition, in effect, of piston rod 23 with respect to platen 14. It will be understood of course, that sources of compressed air and electrical power as well as suitable controls for activating cylinder 22, generally foot operated, are also provided though not illustrated or hereafter further described.

Press 10 is modified for purposes of the present invention by having the platen assembly 12 just described spaced outwardly on base plate 16 from the front face of cabinet 11 by means of a heavy vertical spacer plate 26 rigidly joining the rear faces of platform 21 and cylinder 22 to the frame of cabinet 11 in order to permit the insertion between platen assembly 12 and cabinet 11 of an index removal assembly to be next described. Finally, the entire press 10 is secured upright and surrounded at its front and two sides by a suitable work table 27.

The index guide removal assembly comprises two sub-assemblies. The first is a guide withdrawal assembly employing a pair of parallel, horizontal rollers 30 and 31 of uniform diameter enclosed by suitably resilient, frictional covers and journaled at their ends in suitable bearings blocks 32 secured to base plate 16. Rollers 30 and 31 are vertically stacked tangent to each other along the rear faces of platens 13 and 14 at a level so that the line of tangency of rollers 30 and 31 lies in the plane of the face of platen 13. Both rollers 30 and 31 are somewhat longer than the width of cabinet 11 and are provided at each pair of their respective ends with a pair of meshed pinion gears 33 and 34 located just inboard of their respective bearings blocks 32. The upper pinion 34 at one end of roller 31 is engaged by the forward teeth of an overlying, horizontal rack 35 extending rearwardly and perpendicularly of rollers 30 and 31. Rack 35 is maintained in engagement with said pinion 34 by having its forward end slideably received within a suitable mounting bracket 36 secured directly to base plate 16 forward of said pinion 34, and its rear end fitted within a horizontal, forwardly opening yoke 37 secured in turn to the outer end of piston rod 23 of a collapsed, double acting pneumatic cylinder 39 axially aligned with rack 35 and secured to and alongside cabinet 11 by a bracket 40. For reasons hereafter explained a lost motion connection between rack 35 and yoke 37 is provided employing a pair of lugs or pins 41 extending laterally outwards from opposite side walls of rack 35 through horizontally extending slots 42 in the corresponding side walls of yoke 37, a pair of light, extensible coil springs 43 maintaining rack 35 seated within yoke 37. Cylinder 39 is fitted with a pair of air lines 44 leading to the appropriate ports of a four-way pneumatic valve 45 of the type, for instance, described in U.S. Patent 2,639,728, secured thereabove to the side wall of cabinet 11. Valve 45 is also connected into the compressed air supply to press 10, and the shuttle rod thereof is shiftable by a solenoid 46 from its normal, spring-biased position, in which position air is admitted to cylinder 39 so that it is positively maintained in its collapsed condition. Solenoid 46 is wired into the power supply of press 10 through a microswitch 47 mounted to platform 21 so that it is operated by movement of platform 14 upon activation of cylinder 22, switch 47, however, being of a type such that it is closed only during the opening movement of platen 14.

The remaining index guide removal sub-assembly is a guide transport assembly employing an endless, horizontal conveyor belt 50 extending the full length of roller 30 and 31 between the latter and cabinet 11 and

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at a level just below that of the upper face of platen 13. Conveyor belt 50 is of a width somewhat greater than the height of the index guides to be transported and is carried about a pair of horizontally spaced drums 51, whose axes extend transversely between rollers 30 and 31 and the front face of cabinet 11, being journaled in suitable bearings blocks 52 fixed to base plate 16. One of drums 51 is driven by an appropriate pulley 53 at the rear end thereof which in turn is driven by drive belt 54 and motor 55 secured to the underside of table 28. Below the discharge end of belt 50 a discharge chute 56 is located effective for receiving a finished index guide assembly 60 from belt 50 and directing it down into an appropriate container (not shown).

Each index guide assembly 60 comprises a generally rectangular index guide 61, such as that shown in U.S. Patent D. 186,559, typically having a raised edge portion 62 of greater height than the remainder of the guide. Over edge 62 is manually slipped a piece of tab envelope forming material pre-cut from clear sheet plastic, such as that sold under the trademark Mylar, and pre-folded to a V-shape to provide on the faces of guide 61 a pair of equal, generally rectangular leaves 63, the inner faces of which, along marginal strips 64 parallel to and spaced inwardly from edge 62, are coated with a polyester type, heat sensitive adhesive. Accordingly, suitable heat and pressure upon leaves 63 will secure the latter to each face of guide 61 in the areas of strips 64, whereupon a pair of open-ended tab envelopes 65 will be formed on guide 61.

In order to secure leaves 63 to guide 61 the operator places the assembly 60, with leaves 63 properly positioned, between platens 13 and 14 so that edge 62 is parallel to rollers 30 and 31. A slight push by the operator then forces edge 62 and the envelope material folded thereover initially between rollers 30 and 31, thus maintaining leaves 63 in proper position. Such initial insertion of guide assembly 60 results in a slight rotation of rollers 30 and 31 which rotation is permitted owing to the lost motion connection between rack 35 and yoke 37. Such connection, or something similar, is necessary or otherwise the air pressure in cylinder 39, acting through rack 35 and pinion gears 33 and 34, would prevent any rotation of rollers 30 and 31 and thus the initial insertion of guide assembly 60 therebetween. Next, operation of press 10 activates cylinder 22 to close platens 13 and 14 upon guide assembly 60 therebetween. Heat and pressure are consequently maintained thereupon until the timer acts to reverse the operation of cylinder 22 and open platens 13 and 14. Rise of the latter closes microswitch 47, energizing solenoid 46 and shifting the shuttle rod of valve 45 against its spring, thus activating cylinder 39 and moving rack 35 forward. The latter motion of rack 35 rotates rollers 30 and 31 through their pinion gears 33 and 34 and carries the now finished index guide assembly 60 therethrough onto conveyor belt 50 whence it is discharged down chute 56. It will be appreciated, of course, that the stroke of piston 39 and the effective length of rack 35 must be enough to provide sufficient rotation of rollers 30 and 31 to carry guide assembly 60 therethrough. Similarly, microswitch 47 must remain closed a sufficient time to insure the complete passage of guide assembly 60 through rollers 30 and 31 before opening to deactivate solenoid 45. Deactivation of the latter permits the bias spring of the shuttle rod of valve 45 to return the latter to its normal position, thus reversing the action of cylinder 39 and withdrawing rack 35, whereupon the apparatus is ready to receive the next guide assembly 60.

While the present invention has been described with reference to a particular embodiment and detailed descriptive language has been used, it is not thereby intended to be limited thereto. Instead, the following claims are to be read as encompassing all modifications and

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adaptations of the invention falling within the scope and spirit thereof.

I claim:

1. Apparatus for annealingly or weldingly securing a pair of tab envelopes to an index guide, such envelopes being formed from an integral preshaped piece of transparent sheet material folded over an edge of said guide to straddle same and thereafter secured by said apparatus to each face of said guide along a prepared marginal area of said material generally parallel to and spaced inwardly from said edge in order to define together with the opposite faces of said guide a pair of oppositely disposed, open ended tab envelopes, said apparatus comprising: a press having a pair of opposed planar pressure exerting members, said members opening to receive said guide and said folded material therebetween and effective upon closing to compress said guide and said areas of said material between said members and secure said areas to said guide, means operable to grasp said guide along the folded edge of said material upon insertion of said guide between said members when open, said means being operably controlled by opening movement of said members to automatically remove said guide and envelopes from between said members upon release of pressure thereon.

2. The device of claim 1 wherein said means includes a pair of axially parallel rollers disposed adjacent said members and adjacent each other so as to rotate and grasp therebetween the folded edge portion of said material and the portion of said guide therebetween when said guide is operatively positioned between said members.

3. The device of claim 2 wherein said rollers are rotatably driven by power means in opposite directions such that by said rotation thereof upon release of pressure by said members upon said guide and envelopes, the latter are withdrawn from between said members and passed through said rollers from one side to the other.

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4. The device of claim 3 wherein said power means are activated by switch means operatively associated with said members to be closed only during opening movement thereof.

5. The device of claim 4 wherein said rollers are provided with meshed pinion gears at their corresponding ends effective for said driving rotation thereof, and wherein said power means comprises a hydraulic cylinder including a reciprocating piston rod having equal, hydraulically impelled movement in each of its two directions, a rack operatively meshed with one of said pinion gears and operatively associated with said piston rod, said rack being effective to rotate said rollers to effect said passage of said guide therethrough upon hydraulic activation of said rod in one of its said directions, said activation being responsive to closing of said switch means, and means to hydraulically activate said rod in the other of its said direction upon completion of the passage of said guide through said rollers.

6. The device of claim 5 wherein said operative association of said rack and piston rod includes lost motion means effective upon rotation of said rollers arising from initial insertion of said guide therebetween to permit movement of said rack without corresponding movement of said piston rod in said first one of its said two directions.

7. The device of claim 6 wherein power driven conveying means are associated with said rollers, said conveying means being disposed on said other side of said rollers and operative to transport said guide away upon its passage through said rollers.

References Cited in the file of this patent

UNITED STATES PATENTS

2,638,964	Andina	May 19, 1953
2,845,010	Keenan	July 29, 1958
2,851,932	Tauber	Sept. 16, 1958