May 3, 1966 R. SCARPA 3,249,272

METHOD AND APPARATUS FOR STRIPPING WASTE FROM A DIE CUT SHEET

Filed Aug. 13, 1964 2 Sheets-Sheet 1

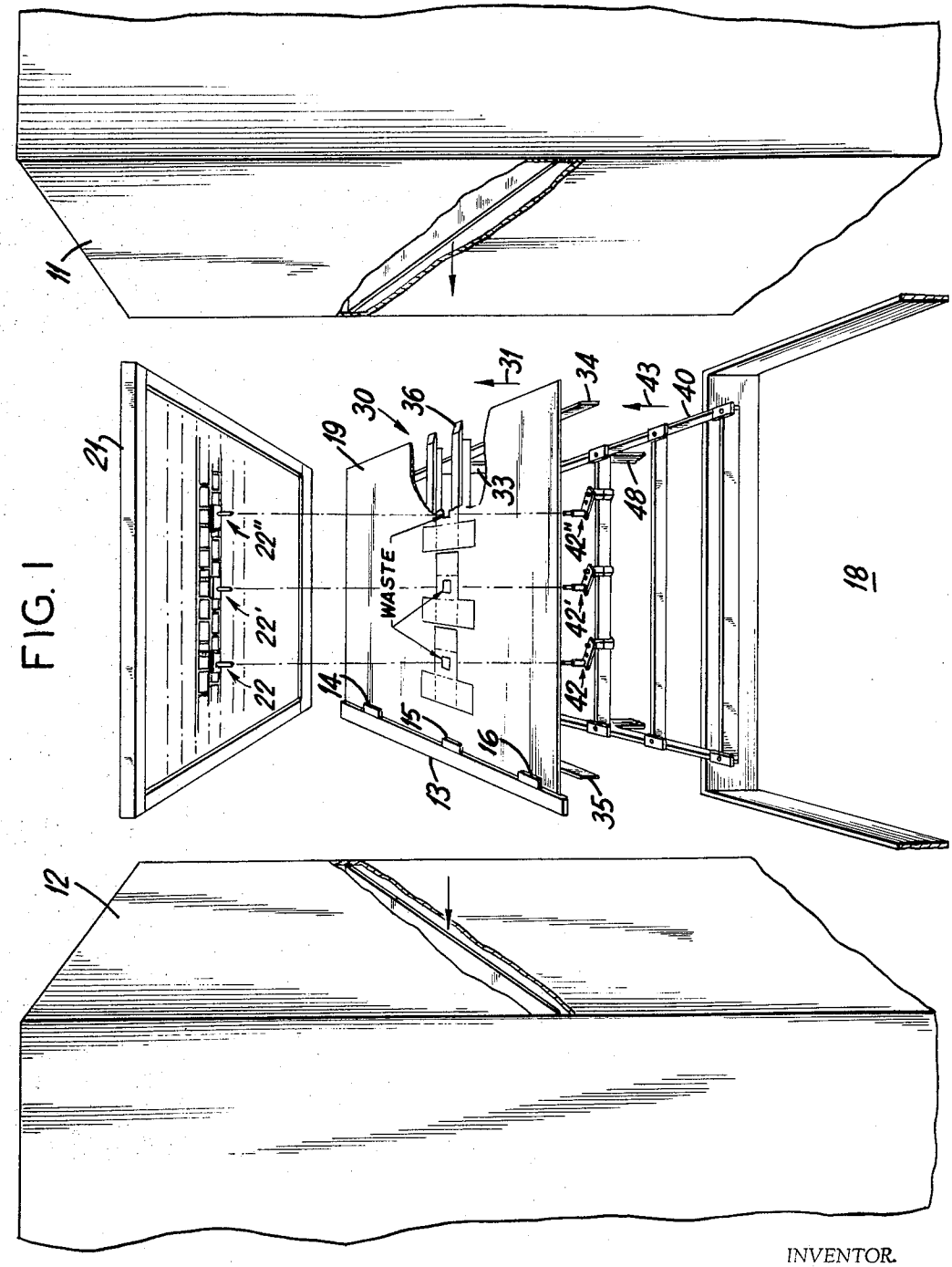


FIG. 1

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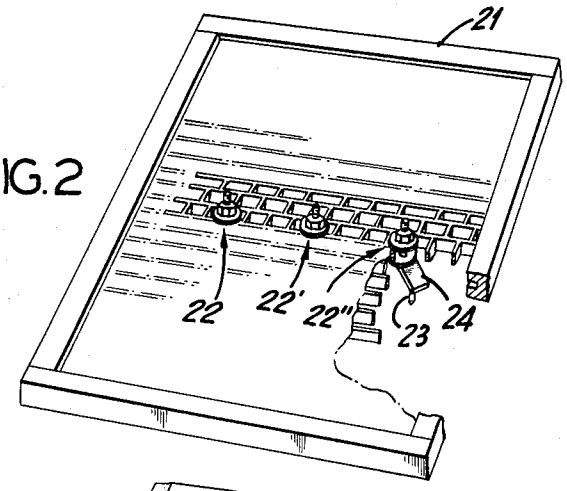
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FIG. 2



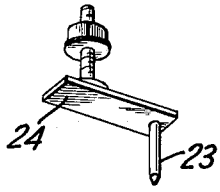


FIG. 2a

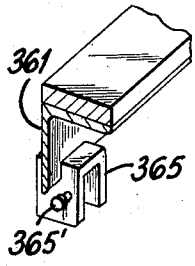


FIG. 3a

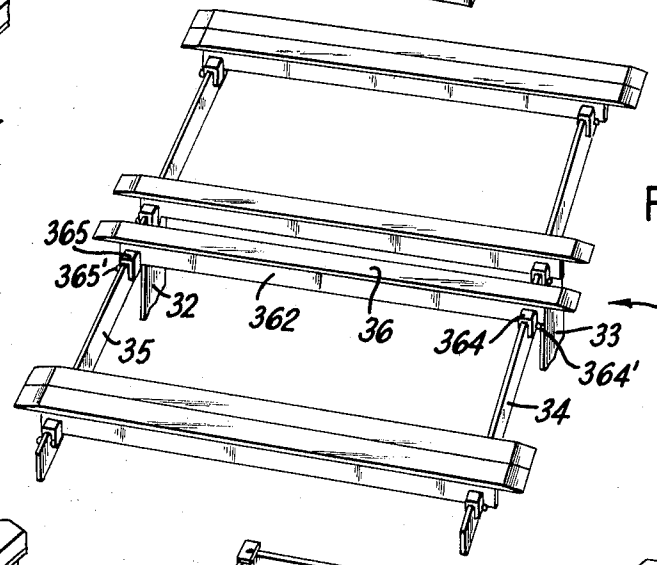


FIG. 3

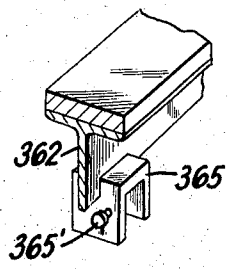


FIG. 3b

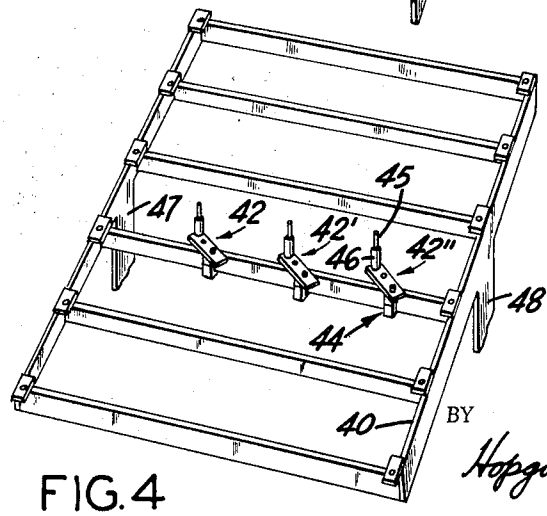


FIG. 4

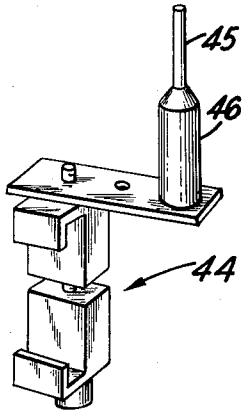


FIG. 4a

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METHOD AND APPARATUS FOR STRIPPING WASTE FROM A DIE CUT SHEET

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8 Claims. (Cl. 225—1)

This invention relates generally to the removal of waste from sheet-like material, and in particular to an arrangement for stripping the waste from the blanks subsequent to the die cutting operation.

In the manufacture of boxes, display cartons, and the like, the conventional production stages involve: sheet printing; die cutting, to outline the box or carton blanks (including windows and folds); and waste removal or stripping. This invention is directed to the latter stage which will be discussed exclusively.

While stripping machines are available to obviate laborious and expensive hand processes, which would otherwise be involved, the machines themselves often give rise to new problems and production costs. For example, conventional waste stripping arrangements employ upper and lower sets of pressure contacting pins which are aligned in predetermined positions above and below the sheet. The sheet is moved vertically, and at the same time the pins move into contact, grasping the waste between them and tearing it loose from the still rising sheet which comes to rest in a higher plane.

Separation of the pins prior to that of the sheet allows the waste to fall free. An alternative arrangement utilizes air pressure to urge the waste downwardly through the sheet. While the foregoing are rather simplified analyses, it is apparent that the sheet must be adequately supported either adjacent to the pin positions, or in the latter arrangement, around the forced air stream; and that without adjacent support, the sheet would merely flex when pressure was applied to the waste. As a consequence, conventional arrangements call for the sheet to be supported on a plywood base, apertured to permit the waste to pass through and at the same time support the remainder.

Although this arrangement is satisfactory when only a single uniform production run is envisaged, most manufacturers have several different jobs awaiting stripping. Each job then requires its own plywood base, and hence entails several hours' services of a skilled die maker. In addition, since it is not known in advance whether a particular job would be reordered, each plywood base must be stored in anticipation of a reorder, the die-cutting making the sheet too valuable to be discarded.

Accordingly, it is the object of this invention to reduce the cost and time involved in stripping waste from die-cut sheets.

It is a further object of the invention to achieve the first object in a simple manner which obviates the necessity for plywood bases.

The above mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will best be understood by reference to the following description of embodiments of the invention taken in conjunction with the accompanying drawings wherein:

FIG. 1 is an exploded perspective of a wire stripping mechanism employing the concept of the invention;

FIGS. 2 and 2*a* illustrate the upper stripping pins and their supporting member;

FIG. 3 illustrates the sheet supporting runners and the runner-supporting frame;

FIGS. 3*a* and 3*b* are perspective illustrations of two preferred cross-sections for the runners; and

FIGS. 4 and 4*a* show the lower stripping pins and their supporting structure.

Before entering upon a detailed analysis of the invention, it bears mentioning that the accompanying figures have been simplified to emphasize the inventive concept. Accordingly, mechanical details, such as vertical drive, housings, feed brushes and rollers, etc., which are well known to those versed in the art, have been omitted for clarity.

Turning now to the figures, and in particular to FIG. 1, there is shown a waste stripping assembly according to the invention. For purposes of illustration, the assembly is shown as an intermediate stage between a die cutter mechanism **11** and a stacker **12**, in which are disposed the next card to be stripped and the card previously stripped, respectively.

The stripper assembly consists of three major components cooperating to remove the waste by displacing the waste and remainder into separate planes. Each of these components is shown in detail in FIGURES 2 through 4, reference to which will be deemed inferred when the respective component (whose initial reference numeral corresponds to the figure number) is described in conjunction with FIG. 1.

The sheet **19** containing the blanks and waste portions is removed from the die cutter **11** by the laterally traversing feeding and positioning bar **13**, the grasping fingers **14**, **15** and **16** of which secure the bar to the sheet. Upon reaching the position shown, the sheet is disposed between the chase **21** and the lower stripping pin supporting frame **40**.

The chase **21** is rigidly mounted in the stripper housing and is hinged (not shown) for access to its underside when inoperative. The entire chase, save for its periphery is honeycombed to permit an infinite positioning of the upper stripping pin assemblies **22**, **22'** and **22''** (for purposes of illustration only three pin assemblies are depicted). Each pin assembly, shown in detail in FIG. 2*a*, comprises a conventional nut, bolt and washer arrangement for securing the affixed pin **23** in the position desired. The eccentric pin mounting on the plate **24** allows an area coverage which would otherwise be precluded by the thickness of the honeycomb.

The opposing lower stripping pin assemblies **42**, **42'** and **42''** are mounted on a supporting frame **40** in alignment with the lower pins **22**, **22'** and **22''**, respectively. This frame is displaceable, via the depending members **47** and **48** and a vertical drive (not shown), in the direction of the arrow **43**. Infinite lower pin positioning is achieved by the C-clamp **44** and a similar eccentric pin-plate mounting to that depicted for the upper pin assemblies. Unlike the upper pin, the lower pin comprises a collapsible spring loaded assembly consisting of a piston **45** and cylinder **46**.

Supporting the sheet between the opposing sets of pins is a platform **30**, vertically displaceable in the direction of the arrow **31** by independent drive means (not shown) acting upon uprights **32** and **33**. The platform **30** comprises a pair of longitudinal rails **34** and **35** upon which the laterally disposed runners **36** (a representative one is designated) are adjustably mounted.

As shown more clearly in the detail cross-sections of FIGS. 3*a* and 3*b*, which depict L-shaped and T-shaped embodiments, respectively, each runner is preferably composed of a metal beam having a T or L-shaped cross-section (**361** or **362**) for rigidity. Atop the beam is a permanently mounted wood slide **363** which is beveled at either the receiving or both ends to ease the passage of the sheet onto the platform. Affixed to the underside of the beam at both ends are C-shaped screw clamps **364** and **365** which sit astride the rails **34** and **35** and are fastened in position by means of the knurled finger screws **364'** and **365'**.

From the foregoing, it will be apparent to one skilled in the art that by additionally allowing the C-shaped screw clamps to be rotatably mounted on the runners, with at least one clamp slidable along the beam underside, the runners may be mounted other than perpendicular to the rails. The expense involved in such an arrangement may prove justified in its application to more complicated jobs.

With respect to the initial machine setup, after the upper and lower stripping pins have been placed in aligned opposing positions to grasp the waste, the runners are positioned so that a pair of runners sits on either side of an imaginary line joining a pair of opposing pins. The separation between runners depends upon the size of the waste to be removed and can never be so close as to preclude the passage of pins between them. Since for purposes of illustration, a single rectilinear array of pins has been chosen only two runners are required. The remaining runners may be removed with a sufficient number allowed to remain to support the rest of the sheet.

The stripping operation is as follows: When the sheet has attained the position shown, the platform **30** and lower pin supporting frame **40** rise. At about the time the sheet encounters the upper stripping pins, the lower frame **40** has carried its associated stripping pins into contact with the waste portions which are securely grasped (by virtue of the spring pressure described) between the upper and lower stripping pins. The platform **30** now rises above the point of pin contact, tearing the waste loose. Both the frame **40** and the platform **30** now retrograde, with the former being set in motion first. As a consequence, the waste is released before the platform reaches an equivalent level and since it is below the remainder of the sheet, it falls free into the waste bin **18**. The stripped sheet is now fed by the feeder bar **13** to the stacker **12**. To ensure that the waste does not adhere to the upper stripping pins, their ends are tapered (as shown in FIG. 2*a*) to a smaller abutting surface than that of the lower stripping pins.

While the foregoing description has been directed to cardboard stripping, it will be apparent that it applies with like import to most die cut materials, such as leather, corrugated, etc. Further, it will be appreciated that it would be a simple matter to switch the desired result and allow the waste to remain and the product to fall through. In this case the waste bin would of course serve as a product bin.

While I have described above the principles of my invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention as set forth in the objects thereof and in the accompanying claims.

I claim:

1. The method of stripping waste from a die cut sheet comprising the steps of:

positioning the sheet on a plurality of spaced horizontally elongated runners disposed on either side of the waste to be removed;

displacing the runners and hence the sheet upwards perpendicular to the plane of the sheet;

displacing the waste relatively downwards through the plane of the runners;

and allowing said waste to fall free to a waste storage bin below.

2. In a stripper having means to separate waste from die cut sheets, intermittently and laterally fed to the stripper, by urging the waste and the remaining sheet portion into separate horizontal planes, the improvement therein for supporting the sheet during separation comprising: a frame; a plurality of horizontally elongated runners, and means for slidably positioning said runners on said frame adjacent either side of the waste to be removed.

3. The improvement claimed in claim **2** wherein the frame comprises a pair of parallel longitudinal members, the runners being laterally placed on said members for adjustable longitudinal displacement.

4. The improvement claimed in claim **3** wherein at least the receiving end of each runner is beveled for accepting the laterally fed sheet without hindrance.

5. The improvement claimed in claim **4** wherein each runner is of T-shaped cross section, the horizontal bar of the T being uppermost and including the bevel on its upper face, said horizontal bar further being greater in thickness than the vertical bar.

6. The improvement claimed in claim **4** wherein each runner is of L-shaped cross-section, the horizontal bar of the L being uppermost and including the bevel on its upper face, said horizontal bar further being greater in thickness than the vertical bar.

7. In a stripper, for separating waste from die cut sheets intermittently and laterally fed to said stripper, of the type having a set of upper and a set of lower pressure contacting aligned stripping pins adjustably positioned with respect to said sheet for gripping the waste, and means for independently displacing said sheet and at least one set of said waste gripping pins perpendicularly to the plane of said sheet so that the waste and remaining sheet portion are separated into two planes, the improvement therein for supporting the sheet during its perpendicular displacement comprising: a frame; a plurality of horizontally elongated runners, and means for slidably positioning said runners on said frame adjacent either side of a pair of aligned stripping pins.

8. The improvement claimed in claim **7**, wherein the frame comprises a pair of parallel longitudinal members, the runners being laterally placed on said members for adjustable longitudinal displacement.

References Cited by the Examiner

UNITED STATES PATENTS

1,424,190	8/1922	Cole et al.	269—296 X
1,467,637	9/1923	Hatch	83—623 X
1,750,199	3/1930	Spahn	269—296
1,981,974	11/1934	Vernimb	93—36 X
2,413,999	1/1947	Shaner	83—103
2,557,504	6/1951	Holmes	93—36
2,759,402	8/1956	Jedlick	93—36 X
2,779,257	1/1957	Jedlick	93—36
2,885,165	5/1959	Smolen	269—296 X
3,055,275	9/1962	Schroter	93—36
3,060,776	10/1962	Bobst et al.	93—36

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