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2,433,535

APPARATUS FOR CUTTING AND PACKAGING SHEETS OF MATERIAL

Filed Aug. 12, 1944

2 Sheets-Sheet 1

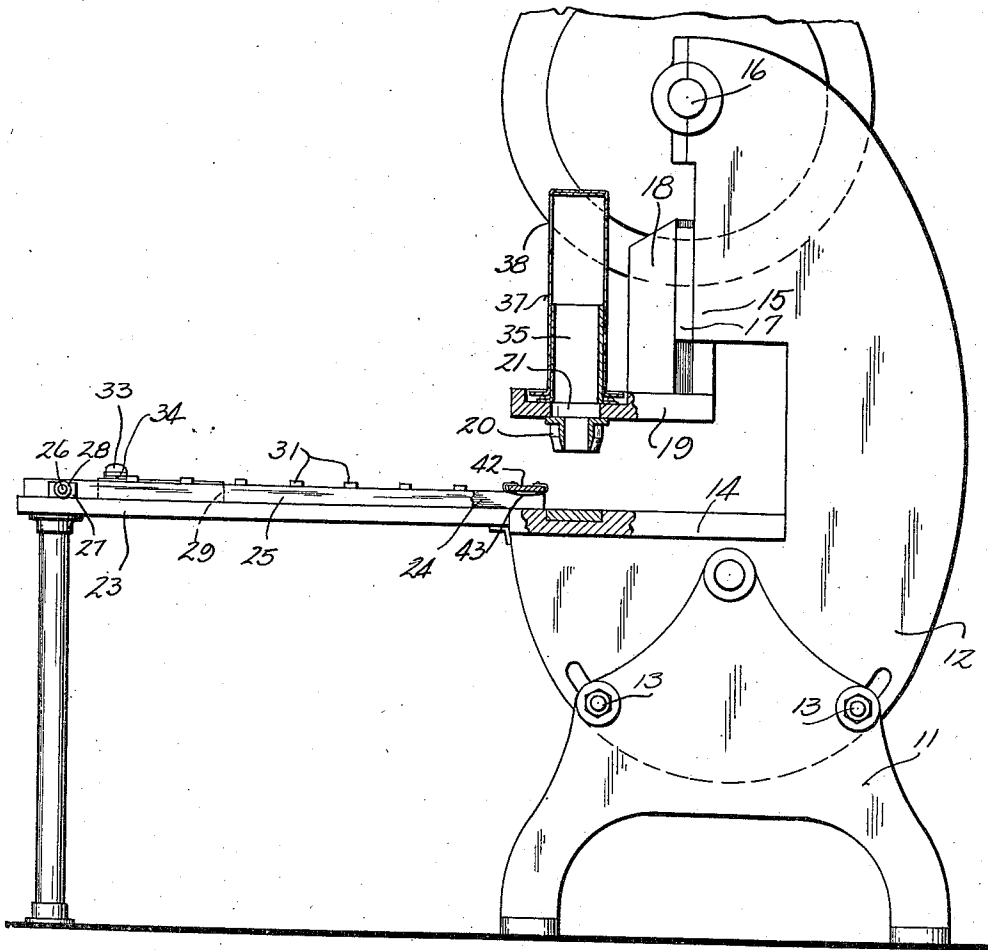


Fig. 1.

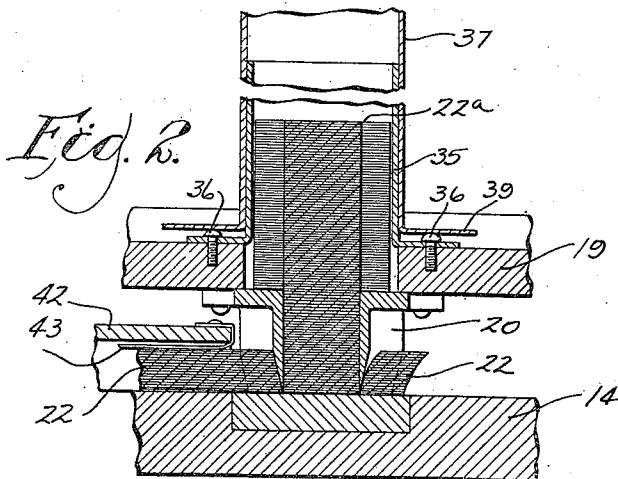


Fig. 2.

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2 Sheets-Sheet 2

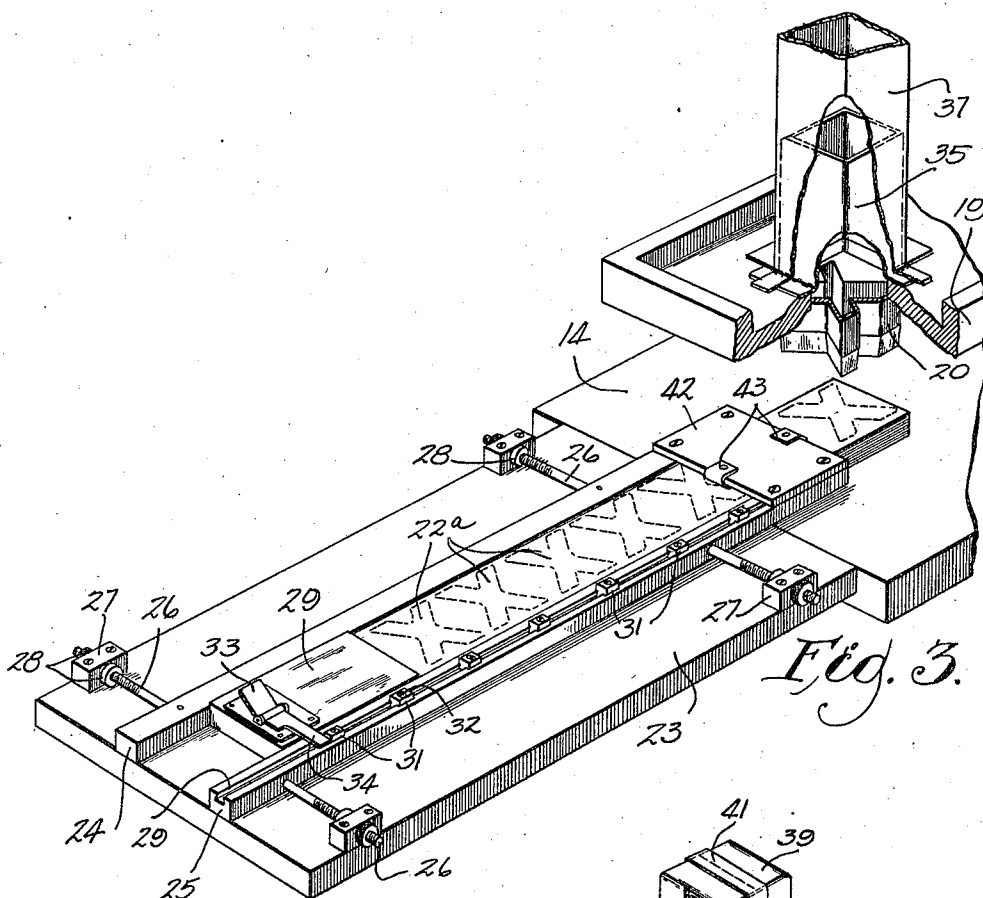
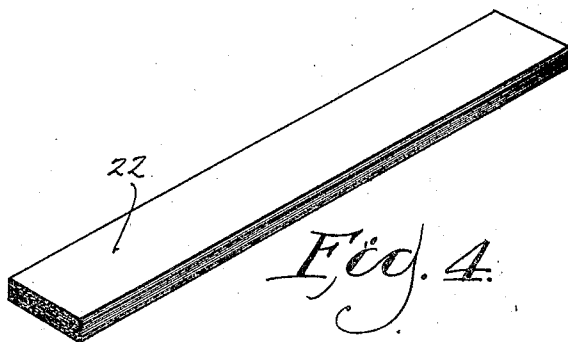


Fig. 3.



Ec. 4.

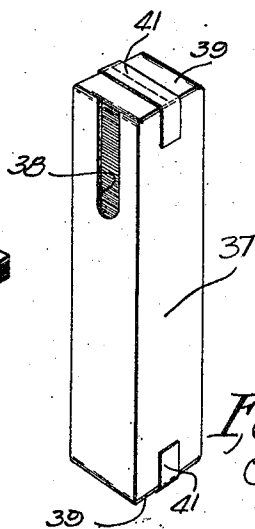


Fig. 5

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APPARATUS FOR CUTTING AND PACKAGING
SHEETS OF MATERIALJacob J. Treis, Whitefish Bay, and Charles Treis,
Milwaukee, Wis.

Application August 12, 1944, Serial No. 549,222

5 Claims. (Cl. 164—25)

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The invention relates generally to improvements in the apparatus for feeding, cutting and packaging labels or the like, and more particularly to a machine embodying novel features of construction and a novel arrangement of parts associated in such manner as to greatly facilitate the preparation and packaging of such labels or the like.

The present invention is primarily concerned with an apparatus of a kind particularly designed to facilitate the cutting out of labels or the like, from sheets arranged in a stack and one in which the stack is easily and accurately advanced predetermined distances step by step following each cycle of machine operation so as to insure accurate spotting of the labels or the like beneath a vertically reciprocable cutting die. The machine also embodies a structure whereby batches of labels or the like, after being cut from the sheet, are progressively urged through the cutting die and are delivered into a shipping container arranged on the machine and which when filled is easily removed and secured closed.

Prior known types of such machines require manual positioning of individual blocks of sheets each containing one label, or other selected portion to be cut out, beneath a cutting die and, after being severed from the block of sheets, the cut out portions and waste portions are manually removed from within and around the die. Obviously such manual positioning of such block of sheets involves considerable experience and skill and even in such instances where extreme care is taken to properly locate the portion to be cut out with respect to the cutting die, the portions to be cut out are not always in perfect register and as a result the labels or other cut out portions are not uniformly alike.

It is therefore an object of the present invention to provide a mechanism for feeding and guiding stacks of sheets containing a plurality of portions to be cut out into positive register with the cutting die.

Further, in known types of die cutting machines of the kind to which this invention pertains, successive cutting and manual removal of batches cut out of individually fed blocks of sheets results in unsatisfactory stacking and alignment of a plurality of such batches, particularly since it is physically impossible to effect accurate alignment of the batches and as a result a stack of such batches, when tied into the customary bundles, is unsightly at best.

Another object of the invention is therefore to provide in a machine of the kind described,

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means whereby the individual batches of labels or other cut out portions are easily and positively guided and deposited within a carton or other shipping container.

5 Prior practice has been to gather together in a single stack a plurality of cut out portions, such as labels, and to tie them securely with string preliminary to inserting them in the cartons or other wrappers. Since it is practically impossible to effect perfect alignment of the edges of such labels, that practice usually results in the labels being torn or otherwise damaged along their edges and frequently they tend to curl. In all instances, however, the labels are so tightly packed together because of tying, that their easy separation, when being used, is exceedingly difficult, with the result that many labels are rendered useless or are otherwise wasted.

10 It is, therefore, another object of the invention to provide a label packaging mechanism which is highly efficient in providing automatic means for packaging the labels during the cutting operation within cartons or like containers in such a manner as to prevent them from being packed with objectionable tightness and to avoid objectionable curling or damaging of the edges thereof.

15 Another object is to provide a machine of the character referred to which is not expensive to manufacture or maintain, and which is easy to operate and highly efficient in use.

20 Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment and the principle thereof, and which is considered to be the best mode for applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention or the purview of the appended claims.

In the drawings:

25 Fig. 1 is a side elevational view of a die cutting apparatus embodying features of the present invention and showing portions thereof broken away.

30 Fig. 2 is a fragmentary sectional detail view, on an enlarged scale, of the cutting die and carton filling mechanism, shown in section in Fig. 1.

35 Fig. 3 is a perspective view illustrating portions of the machine shown in Fig. 1.

40 Fig. 4 is a perspective view of a stack of strips of sheet material.

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Fig. 5 is a perspective view of a carton containing labels cut and stacked therein by the machine of the present invention.

The mechanism constituting the subject matter of the present invention is best illustrated in Fig. 1 as being embodied in a conventional type of die cutting machine. The die cutting machine may include a base frame 11 having spaced side frames 12 (only one shown) secured thereon for limited adjustment relative thereto, as by bolts 13. The side frames 12 carry a horizontally disposed bed plate 14 and one portion of said frames extends upwardly and then forwardly, as at 15, to overhang said bed plate and provide a journal for a driven shaft 16. The overhanging portion 15 on each frame 12 is provided with a suitable vertical track 17 along which a head 18 is arranged to slide. Movement of the head 18 is effected during operation of the machine through rotation of the shaft 16.

The head 18 is provided on its lower end with a horizontally disposed platform 19 which extends forwardly thereof, as best shown in Fig. 1, and which may be secured thereto in any suitable manner so as to move with said head as a single unit. A hollow cutting die 20 is firmly secured to the bottom face of the forwardly extending portion of the platform 19 in substantial vertical alignment with an opening 21 in said platform. It should be obvious at this time that upon movement of the head 18 from the position illustrated in Fig. 1 into a lowered position, so as to carry the cutting edge of the die 20 firmly against the bed 14, said die will sever any sheet or sheets of material which might be placed upon said bed therebeneath.

The sheets of material which are to be die-cut during a cycle of operation of the machine described hereinabove, preferably are supplied in strips and are arranged in stacks 22 such as illustrated in Fig. 4. Each of these strips of material is previously prepared by being printed, lithographed, or otherwise impressed with labels 22a or the like, arranged in such manner that each sheet will include a plurality of such labels each of which is to be separated from the strip upon operation of the die cutting machine.

Such die cutting of a stack of sheets, each bearing a label or other representation upon a portion thereof to be severed during a single cycle of machine operation, makes it necessary that the sheets contained in a single stack be maintained in true alignment so that the labels 22a or other portions to be cut out of the strips also are in perfect registry.

The present machine therefore is provided with novel means to align and feed the stacks of strips predetermined distances by a step by step movement between successive cycles of machine operation. To this end, the bed 14 is provided with an extension or table 23 located in the same plane as said bed and upon which a stack of strips is initially positioned. The top surface of the table 23 is provided with a pair of guide rails 24 and 25 which are easily adjusted transversely relative to each other to accommodate stacks of sheets of various widths. Such adjustment of the rails 24 and 25 may be effected in any manner; however, it is preferred that the rails each be provided with outwardly extending threaded rods 26 arranged to extend freely through blocks 27 on said table. A pair of nuts 28 are threaded upon each rod 26, one on either side of its related block 27, so as to facilitate easy adjustment

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of the rails transversely and to effect locking thereof in such adjusted position.

A follower block 29, having a width corresponding to the width of the stack of sheets arranged between the guide rails 24 and 25, is laid between said rails at the rear end of said stack to provide means whereby the sheets in said stack are retained in register during the feeding of said stack of sheets to the die. Thus, with a stack of sheets arranged as shown in Fig. 3, the follower block 29 may be manually engaged, following the completion of one cycle of machine operation, and moved forwardly so as to carry the next successive section of the stack bearing a label 22a into alignment with the die 20.

Since it is essential that the labels 22a or other portion to be cut out of the stack of sheets be in exact registration with the die, co-acting means is provided on the follower block and on one of the guide rails 25 to measure or otherwise regulate the distance which the follower block may be advanced prior to each die cutting operation. Accordingly, the guide rail 25 is formed with a suitable dovetail slot 29 on its upper surface to receive a plurality of stops 31 which stops are suitably spaced apart distances corresponding to the distances between the labels 22a appearing on the sheets in the stack 22. The stops 31 may be secured in such adjusted position as by means of set screws 32 provided one in each stop. The follower block 29 carries a manually actuatable trip latch 33 having a finger portion 34 overlying the guide rail 25, as shown, so that the stops 31 normally lie in the path thereof.

When the stack of sheets is to be advanced, at the completion of one die cutting operation, the trip latch 33 is actuated to lift the finger 34 clear of the stop 31 then located immediately in advance thereof, whereupon the follower block may be moved forwardly a sufficient distance to clear said stop and the trip latch released. The finger 34 of said latch will then be positioned to abut against the next successive stop 31 to thereby limit the forward movement of the follower block. Since the stops 31 are spaced apart distances equal to the spacing between the labels 22a, another batch of labels is thereby aligned with the die 20.

During the cutting operation the die 20 passes through the stack of sheets disposed therebeneath and the cut out labels are retained within the hollow die. As the feeding and cutting operations are repeated, the batches of labels, or other severed portions, contained within the die 20 are progressively urged upwardly therethrough and through the hole 21 in the platform 19. Continued upward movement of the cut out portions eventually causes said portions to enter into a tubular guide 35 firmly secured to the top face of the platform 19 as by screws 36 which guide has a cross sectional area shaped to conform to the shape of the cut out portions.

A shipping carton 37, or other container, of such size as to be fitted freely over the tubular guide 35 is arranged on said guide in the manner illustrated so as to receive the cut out portions as they move upwardly out of the guide 35. In this manner, the shipping container or carton 37 is automatically packed with the cut out portions and said portions are in perfect registry and consequently their edges are not in any manner damaged or otherwise injured, as has been the usual condition with the old method of tying and packaging. The operator may readily observe the filling of the container 37 through a slot 38

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provided in one wall thereof and when a container is filled it is withdrawn from the guide 35 and its end flaps 39 are folded over one upon the other and secured as by a sealing strip 41.

Inasmuch as upward movement of the die 29, after having cut through a stack of sheets, will tend to carry said stack of sheets upwardly therewith, suitable stripper means may be provided on the guide rails 24 and 25 closely adjacent to said die. Such means is best illustrated in Fig. 1 and it may consist of a bridgelike plate 42, rested upon and detachably secured to the rails 24 and 25, having a yieldable member 43 adapted normally to bear lightly against the top of the stack.

It should be evident that the method of cutting batches of labels or other portions from sheets arranged in stacks and the mechanism for accomplishing the purposes of this invention, are very accurate and highly efficient and practical in that the rate of production is speeded up and the labels are at no time subjected to the damaging effects of tying or manual bundling and packaging. Further, labels loosely packed in the manner described hereinabove retain their original looseness or fluffiness and are not in any way pressed together to such an extent as to cause wrinkling, warping or curling thereof while packaged.

Although an exemplary form of the invention has been described herein and disclosed in detail in the accompanying drawings, it is to be understood that the invention is capable of a wide variety of modifications and that it is not to be limited to the precise disclosure but is to embrace such details as fall within the spirit of the invention and the scope of the appended claims.

We claim:

1. In a machine of the character described, having a reciprocable hollow die, a bed including an extension, guides mounted on said extension, said guides being adapted to guide a stack of sheets onto the bed beneath said die, means to adjust said guides to accommodate stacks of various width, a follower for the stack movable between said guides, a plurality of stops on at least one of said guides, and a latch on said follower engageable with any of said stops to limit the advance of the stack beneath said die.

2. In a machine of the character described, having a reciprocable hollow die, a bed, an extension on said bed, guide means on said extension and bed adapted to receive and guide a stack of sheets into position on said bed to be

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acted upon by the die during a cycle of machine operation, a follower for said stack in said guide, and coacting means on said follower and on said guide effective to limit the distance the stack is advanced after each cycle of machine operation.

3. In a machine of the character described, having a reciprocable hollow die, a bed, an extension on said bed, guide means on said extension and bed adapted to receive and guide a stack of sheets into position to be acted upon by the die during a cycle of machine operation, a stripper to retain the stack of sheets in place upon withdrawal of the die from said stack, a follower for said stack in said guide, and coacting means on said follower and on said guide effective to limit the distance the stack is advanced after each cycle of machine operation.

4. In a machine of the character described, having a reciprocable hollow die, a bed, an extension on said bed, guide means on said extension and bed adapted to receive and guide a stack of sheets into position to be acted upon by the die during a cycle of machine operation, a follower for said stack in said guide, a plurality of adjustable stops on said guide, and means on said follower successively engageable with said stops while progressively advancing the stack of sheets predetermined distances beneath the die after each cycle of machine operation.

5. In a machine of the character described having a reciprocable die and a surface to support material to be acted upon by said die, guides adapted to guide said material along said surface into position beneath said die, said guides being adjustable to accommodate material of various widths, a follower for the material movable between said guides, a plurality of stops on at least one of said guides, and a latch on said follower engageable with any of said stops to limit the advance of the material beneath said die.

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