Jan. 11, 1949. G. G. MESSERSMITH 2,458,867

METHOD OF AND APPARATUS FOR PREPARING CREASING COUNTERS

Filed June 7, 1947

Fig. 1

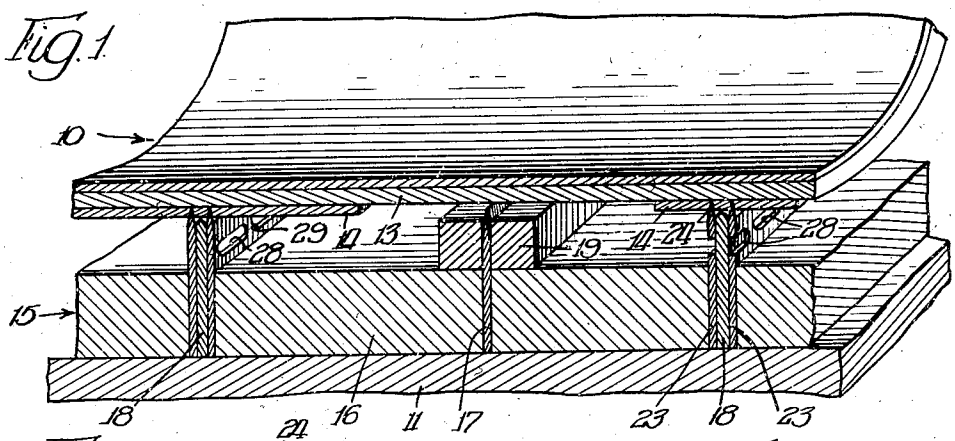


Fig. 2

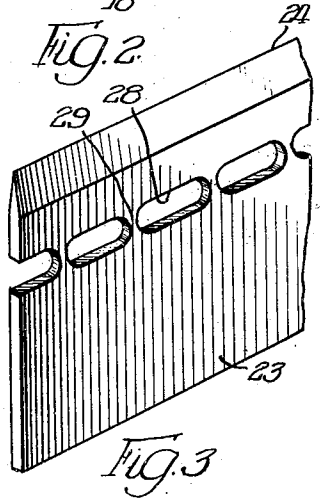


Fig. 5

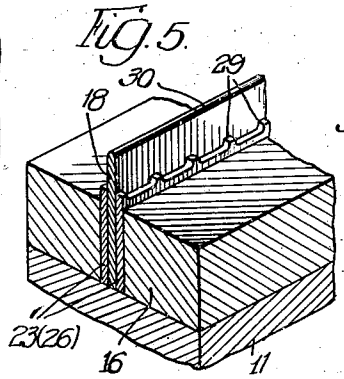


Fig. 7

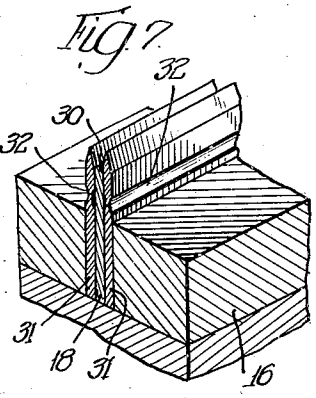


Fig. 3

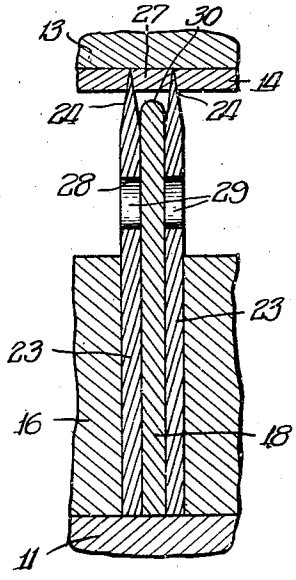


Fig. 4

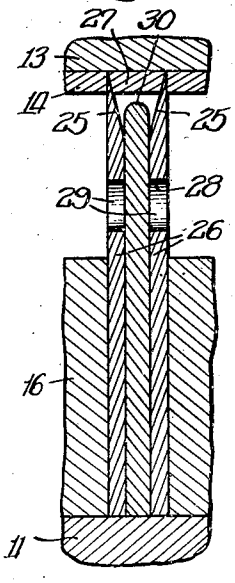
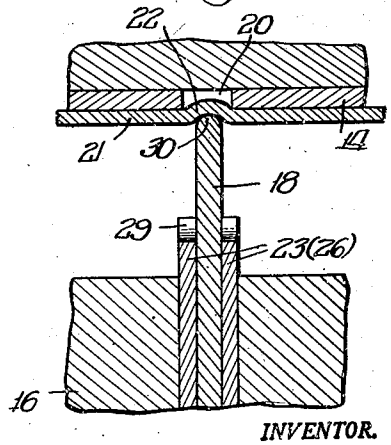


Fig. 6



INVENTOR.

George G. Messersmith,

BY

Cromwell, Greist + Warden

attys.

Patented Jan. 11, 1949 2,458,867

UNITED STATES PATENT OFFICE

2,458,867

METHOD OF AND APPARATUS FOR PREPARING CREASING COUNTERS

George G. Messersmith, Chicago, Ill., assignor to J. F. Helmold & Bro., Inc., Chicago, Ill., a corporation of Illinois

Application June 7, 1947, Serial No. 753,341

13 Claims. (Cl. 76—107)

1

The present invention pertains generally to a simplified, time and labor saving method, and apparatus for performing the same, to prepare the counter or counterscore sheets of the type ordinarily employed in conjunction with standard metal creasing rules in the blanking and creasing of fibrous sheet material, such as folding cardboard box blanks, corrugated board and the like. Such counters are normally mounted on the cylinder or platen member of a press, and coact with creasing rules, which are blocked up on an opposed bed member of the press, in the creasing of paperboard and like materials in an appropriate pattern. To this end, in accordance with conventional practice, said counters are routed out along lines registering with the creasing rule in said die, the width of the routed lines exceeding the width of the rule to accommodate the stock when the press members are brought together and operated in the actual creasing step.

The usual operation of preparing the creasing counter is a laborious, exacting and time consuming one in which the operator first mounts the material of the counter on the press cylinder or platen and blocks up the cutting knives and creasing rule in a die on the press bed. He then inks the exposed working edge of the creasing rule, brings the press members together and operates the same to transfer onto the counter a light ink marking as a guide for a subsequent routing operation. The press members are next separated and the counter routed out by hand in an appropriate width of line following the guide marking. This routing operation, as stated above, is a very exacting one requiring considerable skill and judgment on the part of the operator, and as a result, the work of preparing the counter usually constitutes a disproportionately large factor in the cost of cutting and creasing work in accordance with the conventional procedures.

The present invention eliminates the need for skilled lay-out and routing work in the production of creasing counters, substituting a simple, quickly performed operation which calls for no special skill on the part of the operator and in which the counter is completely prepared by removal of the exact amount of material required, as a single press operation. This is made possible by a novel preliminary assembly of special cutting rules with the creasing rule in the die, said assembly being such that it is only necessary to eliminate the cutting edge of said cutting rule, following use of the assembly to fully prepare the counter, in order to expose the creasing rule and

2

make it available for its intended normal creasing function.

In accordance with the above general outline, it is an object of the invention to provide a novel method for preparing creasing counters in which the need for the usual preliminary line lay-out work is eliminated, together with the necessity of thereafter performing expensive hand routing on the counter.

Another object is to provide an improved apparatus for preparing counters including cutting members or rules associated with a creasing rule in a novel manner to automatically remove material from a cardboard or like counter sheet along a desired outline and in a desired width, as a single counter preparing operation.

A still further object is to provide a special assembly of creasing and cutting rules of the type referred to, in which provision is made to dispose of the cutting edge of the latter following use, in a manner to expose the working edge of the creasing rule, and wherein this is accomplished without disturbing the original blocked up relation of said rules in a creasing or blanking and creasing die.

A still further object is to provide a counter creasing assembly embodying creasing and special cutting rules which are initially blocked up in a die, said cutting rules being weakened in spaced relation to the cutting edge thereof to enable removal or disposition of said cutting edge when it has served its function, in which assembly it is unnecessary to dismantle the die following preparatory cutting operation and prior to the actual creasing operation.

The foregoing statements are indicative in a general way of the nature of the invention, but other and more specific objects will be apparent to those skilled in the art upon a full understanding of the present method and the construction and operation of the apparatus for putting the same in practice.

Several embodiments of the invention are presented herein for purpose of exemplification, and it will be appreciated that the invention is susceptible of incorporation in still other modified forms coming equally within the scope of the appended claims.

In the drawings,

Fig. 1 is a fragmentary perspective view of a conventional nature, illustrating the apparatus of the invention in its operative relation to the parts of a standard bed and cylinder type press and indicating the functioning thereof;

Fig. 2 is an enlarged fragmentary perspective

view illustrating one form of special cutting rule employed in the practice of the present invention;

Figs. 3 and 4 are similar enlarged views in vertical transverse section through cutting and creasing rule assemblies in accordance with two alternative embodiments of the invention, as mounted in a die, illustrating the operative relationship of the respective rule elements and indicating the mode of functioning thereof in removing material from a counter on an opposed press part;

Fig. 5 is a fragmentary sectional view in perspective, illustrating the creasing rule and portions of the cutting rules, whether in accordance with the form of Fig. 3 or that of Fig. 4, as they appear following fracturing along a predetermined line of weakness to enable removal of their respective cutting edges, thereby to expose the working edge of the creasing rule for a creasing operation;

Fig. 6 is a fragmentary view in vertical transverse section illustrating the relationship of the press parts, the prepared counter and creasing rule during the actual creasing operation; and

Fig. 7 is a fragmentary perspective view illustrating a counter preparing setup in accordance with a still further modified adaptation of the invention.

Referring to Fig. 1 of the drawings, there is illustrated therein the cylinder 10 and bed 11 of a standard bed and cylinder type press with which the present provisions for preparing counters are associated. However, it should be understood that the principles of the invention are in no way dependent on the particular type of press employed in the ultimate creasing operation for which the counter is prepared. The reference numeral 13 designates a steel cylinder jacket and the reference numeral 14 indicates a flexible fibrous counter or counterscore sheet suitably applied to the jacket. It is with the preparation of said counter that the invention deals.

The bed 11 has a cutting and creasing die, generally designated 15, secured thereon in a conventional fashion, said die consisting of blocking 16 of wood, metal or other suitable material which is employed to block or clamp the respective sharp edged cutting rule 17 and the blunt edged creasing rule 18 in the desired configuration to process the article or blank to be subsequently produced. It will be appreciated that the cutting rule 17 is employed in any desired outline to properly blank out, slit, cut, score, nick or perforate the sheet material to be ultimately processed and that the creasing rule is also appropriately laid out to impart desired uncut creased or fold lines to said material. Such details of shape of the respective cutting and creasing edges are not involved in the invention. In accordance with standard practice, conventional sheet stripping material, such as the compressible cork or rubber members 19, is glued onto the blocking along either side of the cutting rule 17 to strip the material of the blank from said cutter.

The present invention affords a procedure and apparatus for automatically and in a single press operation removing material from the counter 14 in register with and in duplication of the linear configuration of the creasing rule 18, in the manner illustrated in Fig. 6. The purpose of this is to afford clearance space 20 in the counter which ultimately receives and accommodates the material of the blank 21 which is creased, along the crease line 22 produced by said creasing rule. Accordingly, said material is removed in a width predeterminedly exceeding the width of rule 18, which may vary within relatively wide limits depending on the type of work to be produced. As stated above, this operation is usually performed by a skilled router.

In accordance with the present invention, I block up special counter cutting rules 23 on either side of each creasing rule 18 when the die 15 is originally laid out, in the manner illustrated in Figs. 1 and 3. The height of the rules 23 substantially exceeds that of creasing rule 18, as shown in Fig. 3 and they are provided with a sharpened exposed, upper edge at 24, so as to exert a desired cutting and material removing action on counter 14. Said edge may be center face sharpened in accordance with the embodiment illustrated in Figs. 1, 2 and 3, or it may be side face sharpened as indicated at 25 in the alternative embodiment of Fig. 4, wherein the special rule is designated 26. In either case the spacing of the respective sharpened edges from one another controls the width of the strip 27 of material removed from counter 14 to provide the clearance space 20. This in turn depends on the thickness of the stock of the blank or sheet 21 which is to be creased, the thickness of the creasing rule 18 and other considerations.

As illustrated in Figs. 1, 2, 3 and 4, counter cutting rules 23 or 26 are weakened somewhat along a line spaced substantially below and paralleling the respective cutting edges 24 or 25, but above or at least not lower than the level of the blocking 16 when the rules are locked up in operative position therein. In the form illustrated in each of the figures referred to, this weakening is effected by the formation of a plurality of elongated slots 28 in alignment with but spaced from one another by intervening connecting pillars 29 of relatively small cross-sectional area. The shape and size of these openings and pillars may vary in accordance with the dimensions and materials of the respective rules. The weakening should be carried out to a sufficient extent to enable the rule to be fractured with reasonable ease along the weakened zone when desired, using a readily available hand tool such as a chisel or screw driver, yet not sufficiently to destroy the column strength of the rule entirely and thereby interfere with its primary function of cutting the counter. Other methods of producing a weakened zone in the rule, enabling subsequent fracturing in that zone and removal or disposition of the upper cutting portion and consequent exposure of the working face of creasing rule 18, will suggest themselves to those skilled in the art.

With the creasing and counter cutting rules 18, 23 or 26 installed in the die, the cylinder 10, bed 11 or equivalent press parts are approached toward one another sufficiently to enable the cutters to penetrate counter 14 and are operated to cause the cutting edges 24 or 25 to free the strip 27 from counter 14. The press parts are then separated and strip 27 is removed to expose the clearance space 20. Next, using any suitable instrument such as a screw driver or the like, the operator proceeds to bend and/or fracture the upper portion of rule 23 or 26 along the elongated zone of weakening of the rule. This enables the cutting edges 24 or 25 to be removed or at least lowered substantially in the lateral direction, if not entirely removed, thereby exposing the working face or edge 30 of the creasing rule 18, in the manner illustrated in Fig. 5. The press parts are then re-approached and the die is ready for use, in which position of the

parts the creasing rule is opposed by a registering clearance area 20 of appropriate width in counter 14, as shown in Fig. 6.

Any desired method of predeterminedly weakening the rules 23 may be resorted to which is consistent with the above purpose. Thus in Fig. 7 I illustrate special counter cutting rules 31 which are weakened by indenting, grooving or otherwise reducing the cross-sectional width thereof along lines 32 on opposite sides thereof which parallel the cutting edge of the rule. Other adaptations for the same purpose will readily suggest themselves to those skilled in the art.

From the foregoing it is believed apparent that I have provided a method and apparatus which greatly reduces the time, labor and skill required in the preparation of creasing counters and which, notwithstanding the slight factor of cost involved in the use of the special counter cutting rules, substantially reduces the overall cost of preparation of counters accordingly.

Various further adptations of the invention will occur to those skilled in the art. For example, special cutting rules employed in association with the creasing rule need not be of height coextensive with that of the creasing rule. Provisions for wedgingly or frictionally engaging special sharpened cutting rules of this type in side-by-side engagement with the creasing rule and permitting withdrawal of the sharpened members following the preparatory countercutting operation at once suggest themselves. I therefore desire that all such substitutions and modified adaptations be regarded as within the scope of the present invention as defined by the appended claims.

I claim:

1. Apparatus for the preparation of creasing counters, comprising a support having a creasing rule and a pair of special cutting rules rigidly mounted therein on opposite sides of said creasing rule, said cutting rules having elongated knife edges spaced laterally from and projecting beyond the working face of the creasing rule and being weakened along lines paralleling and spaced rearwardly of said knife edges and said working face, thereby to enable removal of said knife edges at a point behind said working face following a material cutting operation of said cutting rules and to leave said working face exposed for a creasing operation.

2. Apparatus for the preparation of creasing counters, comprising a support having a creasing rule and a pair of special cutting rules rigidly mounted therein on opposite sides of said creasing rule and coextensive in length therewith, said cutting rules having elongated knife edges spaced laterally from and projecting beyond the working face of the creasing rule and being weakened by removal of material thereof along lines paralleling and spaced rearwardly of said knife edges and said working face, thereby to enable removal of said knife edges at a point behind said working face following a material cutting operation of said cutting rules and to leave said working face exposed for a creasing operation.

3. In apparatus for the preparation of creasing counters, a special cutting rule adapted to be rigidly mounted in a die paralleling a creasing rule, said cutting rule having an elongated knife edge and being weakened rearwardly of said knife edge to enable removal of the latter.

4. In apparatus for the preparation of creasing counters, a special cutting rule adapted to be rigidly mounted in a die paralleling a creasing rule, said cutting rule having an elongated knife edge and being weakened by a line of perforations paralleling and rearwardly of said knife edge to enable removal of the latter.

5. In apparatus for the preparation of creasing counters, a special cutting rule adapted to be rigidly mounted in a die paralleling a creasing rule, said cutting rule having an elongated knife edge and being weakened by removal of material along a line paralleling and rearwardly of said knife edge to enable removal of the latter.

6. In apparatus for the preparation of creasing counters, a special cutting rule having an elongated knife edge and weakened rearwardly of said edge by reduction of the cross sectional width thereof along a line paralleling said edge to enable removal of said knife edge when desired.

7. A special cutting rule comprising a thin elongated blade having a sharpened cutting edge and provided with a row of weakening perforations paralleling and spaced substantially rearwardly of said edge there being sufficient of the material of said blade between said perforations to impart adequate column strength thereto to sustain a single paper cutting operation and also to permit convenient fracturing along said row when desired.

8. Apparatus for preparing creasing counters comprising a creasing rule having an elongated working face, a pair of similar cutting rules disposed on either side thereof and rigidly locked therewith in a die, said cutting rules having cutting edges projecting substantially beyond the working face of said creasing rule and each being provided with a weakening line behind said cutting edges and working face but above the adjacent exposed surface of said die thereby to facilitate removal of said cutting edges following a counter cutting operation and to expose said working edge for a counter creasing operation.

9. Apparatus for preparing creasing counters comprising a creasing rule having an elongated working face, a pair of similar cutting rules disposed on either side thereof and rigidly locked therewith in a die, said cutting rules having cutting edges projecting substantially beyond the working face of said creasing rule and each being provided with a weakening line of elongated apertures behind said cutting edges and working face but above the adjacent exposed surface of said die, thereby to facilitate removal of said cutting edges following a counter cutting operation and to expose said working edge for a counter creasing operation.

10. In apparatus for preparing creasing counters, a pair of similar cutting rules adapted to be mounted in fixed relation to a creasing rule on either side thereof, said cutting rules each having elongated knife edges and having means spaced rearwardly of said edges to weaken and facilitate fracturing of the respective rules along lines generally paralleling said knife edges, whereby to expose the working face of the creasing rule.

11. A method of preparing a creasing counter for operation in conjunction with a creasing rule, comprising rigidly supporting said creasing rule in a die together with elongated cutting rules on each side thereof which project beyond the working face of said creasing rule, simultaneously applying said cutting rules under pressure to an opposed counter to remove material therefrom between the cutting edges of the rules, and thereafter fracturing said cutting rules along the length thereof and behind said working face of

the creasing rule, whereby to remove said cutting edges and expose said working face without altering the relation of said creasing rule to the die.

12. In apparatus for the preparation of creasing counters, a special sharp-edged cutting rule adapted to be rigidly mounted on a die in parallel and side contacting relation to a standard creasing rule, with the sharpened edge thereof substantially overlapping the working face of said creasing rule.

13. In apparatus for the preparation of creasing counters, a creasing rule and a pair of special sharp-edged cutting rules adapted to be rigidly mounted on a die in parallel and side contacting relation to said creasing rule, with the sharpened edges thereof substantially overlapping the working face of said creasing rule.

GEORGE G. MESSERSMITH.

No references cited.