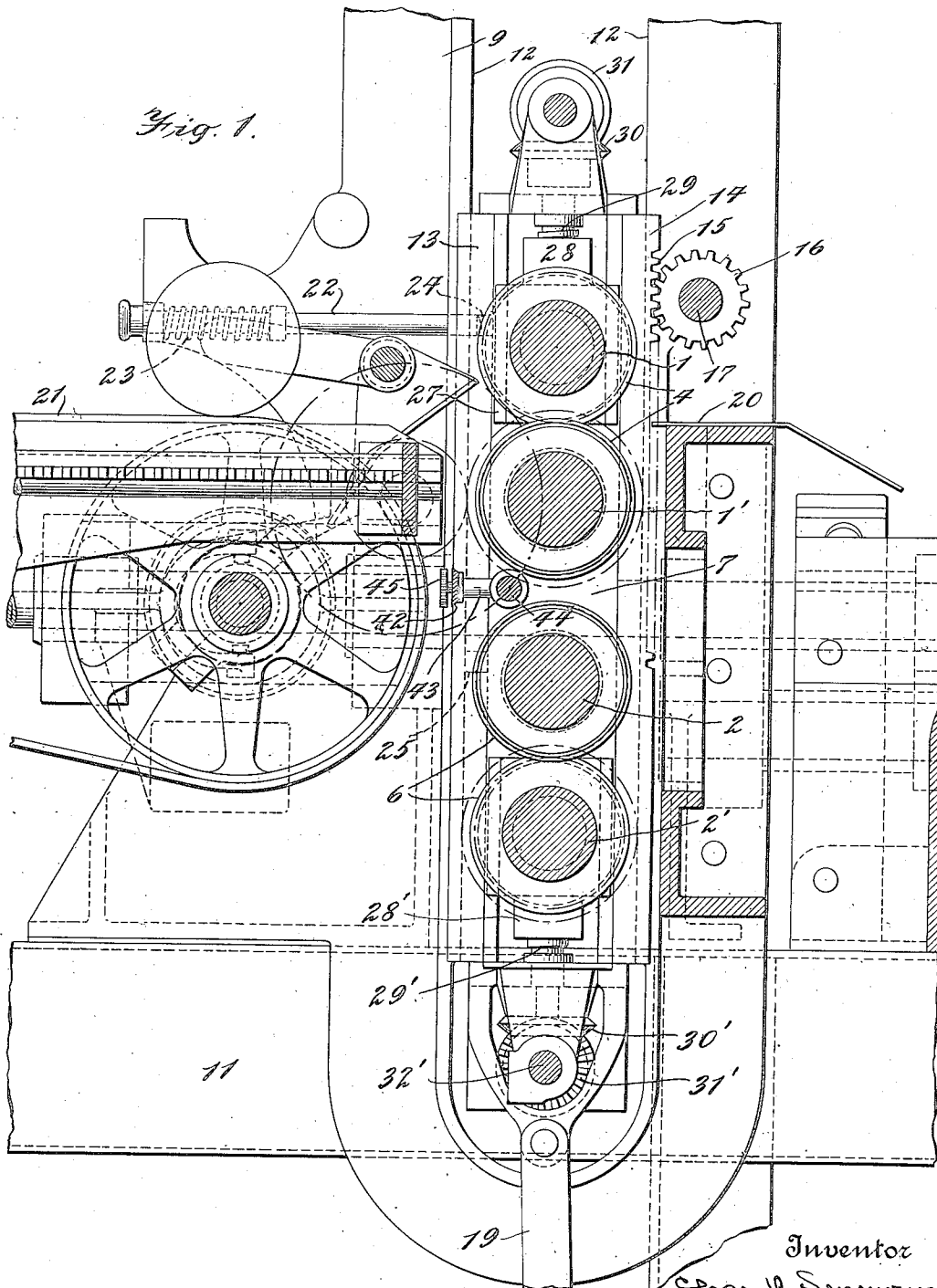


C. R. SEYMOUR.
CREASING AND SLITTING MECHANISM.
APPLICATION FILED DEC. 20, 1915.

1,278,766.

Patented Sept. 10, 1918.

2 SHEETS—SHEET 1.



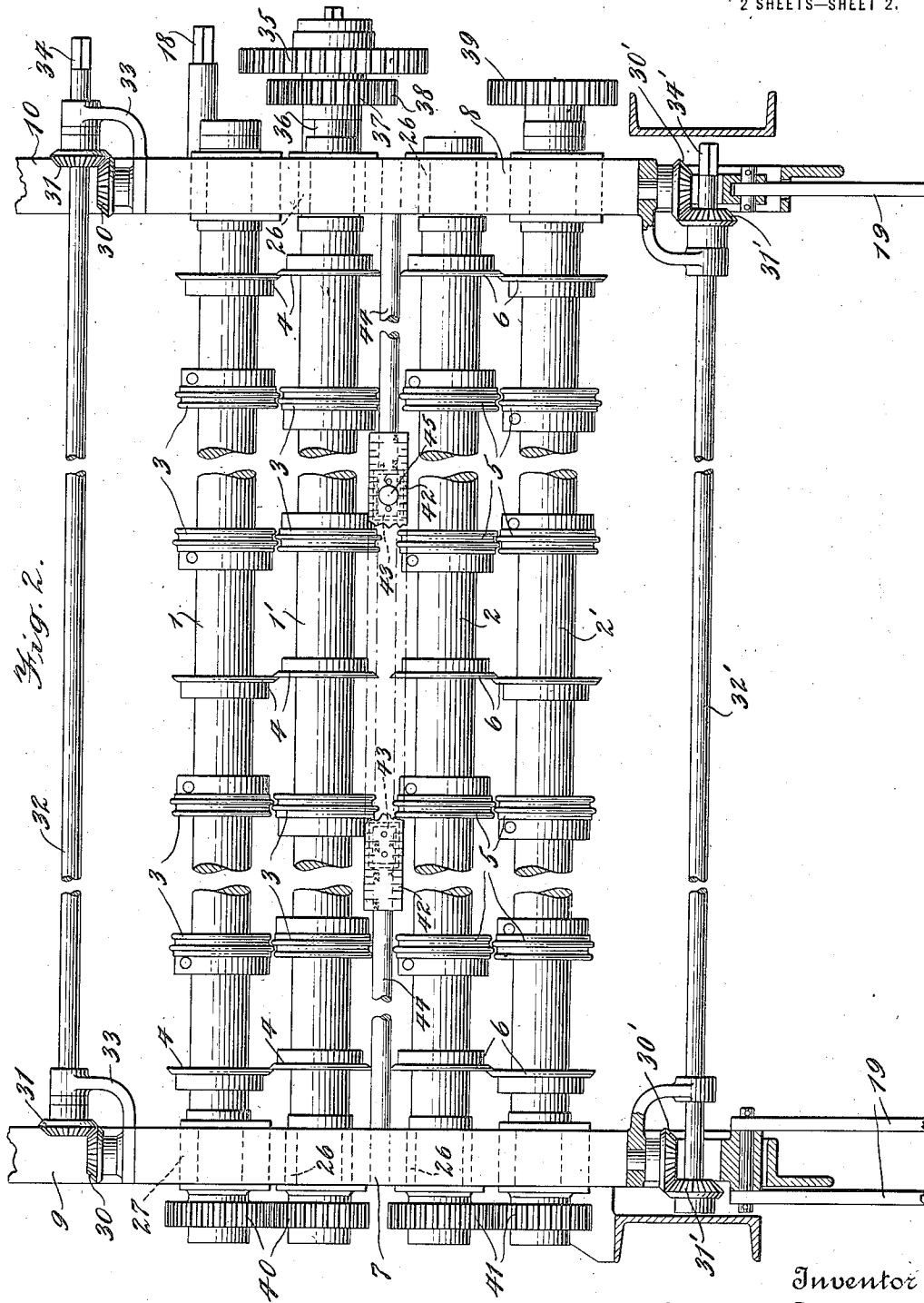
Inventor
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UNITED STATES PATENT OFFICE.

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CREASING AND SLITTING MECHANISM.

1,278,766.

Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed December 20, 1915. Serial No. 67,816.

To all whom it may concern:

Be it known that I, CHARLES R. SEYMOUR, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Creasing and Slitting Mechanism, of which the following is a specification.

The present invention has for its object to provide improved mechanism for operating upon a web of material, such as lined corrugated board, paper board for making box blanks, or other similar materials. The operations performed upon the web of material may be the formation of creases in the web, or slitting the web longitudinally, or both, the specific character of the operations performed upon the web being dependent upon the character or type of the elements associated with the mechanism for performing these operations.

The mechanism herein disclosed was designed especially for operating upon a web of lined corrugated board, but as will hereinafter appear, other materials than lined corrugated board may be operated upon just as efficiently. In the present instance, the mechanism is provided with cutting and creasing elements for providing the web with a plurality of longitudinal creases and for slitting the web longitudinally. The cutting and creasing elements are rotary and are mounted upon two pairs of rotary mandrels or shafts, which, in turn, are arranged in a vertical series. Mechanism is provided for raising and lowering the entire series of shafts to bring either pair into operative relation with the web of material so that the latter will pass between the shafts of such pair, and hence between the cooperating cutting and creasing elements on these shafts. While one pair of shafts and the cutting and creasing elements thereon are being utilized for operating upon the web of material, the other pair of shafts are in their inoperative position. While two of the shafts with the cutting and creasing elements thereon are in their operative position and operating upon the web of material, the cutting and creasing elements on the two shafts in the inoperative position may then be adjusted for the succeeding order, that is for the manufacture of a slitted and creased web having the creases and

probably the slits formed in the web along other lines.

As above stated, the present mechanism was designed for operating upon lined corrugated board and was designed especially for use in combination with the machine disclosed in the co-pending joint application of O. M. Hoch and myself, Serial No. 69,097, filed December 28, 1915. The mechanism forming the subject matter of the present application is disclosed in the above-mentioned co-pending application in combination with mechanism for performing certain other operations upon the web, but is not claimed therein. It will be understood that the cutting and creasing mechanism herein disclosed is not limited to use in combination with a machine of the above-mentioned character, but may be used as a unit by itself or in combination with any other mechanism necessary for performing other operations upon the web.

The invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal section through the center of the improved slitting or cutting and creasing mechanism; and

Fig. 2 is a rear elevation, partly in section, of the improved cutting and creasing mechanism.

Referring to the drawings, it will be noted that two pairs of shafts or mandrels are employed, the shafts of one pair being shown at 1 and 1', respectively, and those of the other pair at 2 and 2', respectively. Each pair of the shafts has positioned thereon, the elements for performing the necessary operations upon the web. In the present instance, creasing blades and slitting knives are mounted upon the shafts, the creasing blades for the shafts 1 and 1' being shown at 3, and the slitting knives for the shafts 1 and 1' being shown at 4. Likewise, the creasing blades for the shafts 2 and 2' are shown at 5, and the slitting knives for the shafts 2 and 2' are shown at 6. The number of pairs of slitting knives and creasing blades will depend upon the number of places at which the web is to be slitted and the number of creases with which the web is to be provided. In the present instance, the pairs of slitting knives at the extreme ends of the shafts are for the purpose of trimming the edge portions of the

web, and the pair of knives shown at the mid-portion of each pair of shafts is for the purpose of dividing the web longitudinally. The creasing blades are provided in sufficient number, in the present instance, to provide the web with two creases at either side of the central slit. It is obvious that the exact arrangement of these elements upon the shafts is immaterial and the number thereof may be decreased or increased, as desired. Furthermore, it is not even essential that the elements take the form of cutting and creasing blades, because so far as the broad aspect of invention are concerned, it is immaterial what the specific character of the elements upon the shafts happen to be.

Both pairs of shafts are mounted in side housings 7 and 8, which housings are mounted for vertical sliding movements in the side frames 9 and 10, respectively. The side frames 9 and 10 may be supported in any suitable manner, such as upon the frame 11 of the machine in combination with which the present cutting and creasing mechanism is used. Each side frame is provided with the guideway 12 in which the corresponding housing is adapted to slide. The specific manner of slidably mounting the housings in the guides 12 is immaterial, but, in the present instance, each of the housings is provided with gibs 13 and 14, capable of retaining the housings in place with respect to the frames 9 and 10 and the guideways 12 formed therein.

One of the gibs at each side of the machine, for instance, the gib 14, is provided along its outer edge with a series of teeth 15, so that said gib constitutes in effect a rack bar. At each side of the machine, a pinion 16 meshes with the teeth 15, the two pinions 16 being mounted upon a transverse shaft 17 rotatably journaled in the side frames 9 and 10. The shaft 17 may be rotated by means of a crank applied to the squared extremity 18 of the shaft (Fig. 2). It is obvious that by turning the shaft 17, the pinions 16 will rotate and either raise or lower the housings 7 and 8 in the frames 9 and 10. This is for the purpose of bringing one or the other of the pairs of shafts into proper relation with the web of material, so that the same will pass between the shafts so brought into operative position. In order to facilitate movement of the housings from the shaft 17, links 19 may be pivoted to the lower portions of the housings and these may be acted upon by counter-weights not shown in the drawings, but mounted in any suitable manner.

In Fig. 1 it will be noted that the web of material to be treated passes over the plate 20, and, therefore, the top pair of shafts is in operative relation with respect to the web. In other words, in the position of the shafts shown in Fig. 1, the web of material will

pass between the shafts of the upper pair and hence, be operated upon by the cutting and creasing elements associated with said shafts. The web may be fed to the shafts by hand, if desired, or when the present cutting and creasing mechanism is associated with a machine for performing other operations upon the web, the feeding elements of such machine may be depended upon to feed the web to the cutting and creasing shafts. Fig. 1 shows a discharge belt 21 for conducting away the web. This discharge belt and the mechanism associated therewith constitutes a portion of the machine disclosed in the above mentioned co-pending application.

When either set or pair of shafts is brought into operative position, it is desirable to lock the housings 7 and 8 in position. This may be done by providing a locking pin 22 at each side of the machine mounted in the corresponding side frame. These pins are mounted to slide longitudinally and are held in their innermost position by means of coil springs 23. When the upper pair of shafts is in the operative position, the extremities of the pins 22 are capable of engaging in openings 24 formed in the housings 7 and 8 to support or lock the housings 7 and 8 in place, and when the lower pair of shafts is in operative position, the extremities of said pins are adapted to engage in similar openings 25 to likewise lock the housings in position. It is obvious that before the housings can be moved to change the position of the shafts, the pins 22 must be withdrawn against the tension of the coil springs 23.

Means is preferably provided for adjusting the distance between the two shafts of each pair to either move the cutting and creasing blades toward or away from each other. This may be done by mounting the lowermost shaft 1' of the upper pair and the uppermost shaft 2 of the lower pair in bushings 26, which, in turn, are rigidly mounted in the housings 7 and 8. The upper shaft 1 of the upper pair and the lower shaft 2' of the lower pair are mounted in bearing boxes 27, which are capable of sliding vertically in the housings 7 and 8. The two upper boxes 27 have associated therewith upwardly projecting hub portions 28 which are internally threaded to receive a screw shaft 29. Each screw shaft 29 is rotated by means of a beveled gear 30 mounted thereon which meshes with a beveled pinion 31. The two beveled pinions 31 (Fig. 2) are mounted upon a transverse shaft 32 supported by means of brackets 33 on the housings 7 and 8. The extremity of the shaft 32 is squared as shown at 34 to receive a crank handle by means of which the shaft 32 may be rotated to simultaneously raise or lower the two upper bearing boxes 27. It is obvious that the raising or lowering of

the two upper bearing boxes 27 adjusts the distance between the shafts 1 and 1' of the upper pair.

A similar arrangement comprising screw shafts 29' engaging with the downwardly-extending hub portions 28' of the lower bearing boxes 27 serves to adjust the distance between the shafts 2 and 2' of the lower pair. The screw shafts 29' carry beveled gears 30', each of which meshes with a beveled pinion 31' mounted upon a transverse shaft 32' similar to the shaft 32 above described. This shaft 32' is also provided with a squared extremity 34' capable of receiving a crank handle to rotate the shaft. By rotating the shaft 32', it is obvious that the lower boxes 27 will be raised or lowered to adjust the distance between the shafts 2 and 2' of the lower pair.

The shafts which carry the cutting and creasing elements are positively rotated by mechanism designed so as not to interfere with the vertical movement of the shafts and which is designed to positively drive the two shafts which happen to be in operative position. As shown in Fig. 2, a driving gear 35 is provided which may be driven in any appropriate manner depending upon the relation in which the present cutting and creasing mechanism is used. The gear 35 is mounted upon a stub shaft 36 which also carries a pinion 37, so that the gear 35 and the pinion 37 rotate in unison. The lowermost shaft of each pair, that is the shafts 1' and 2', have secured thereto gears 38 and 39, respectively. The pinion 37 and gear 35 are so positioned with respect to these gears 38' and 39 that when the upper pair of shafts is in the operative position, the pinion 37 will mesh with the gear 38, and when the lower pair of shafts is in operative position, the pinion 37 will mesh with the gear 39. When the gear 38 is rotated, the shaft 1' is positively rotated and transmits motion to the shaft 1 through the meshing gears 40. Likewise when the gear 39 is rotated, the shaft 2' imparts motion to the shaft 2 by means of the meshing gears 41. It is, therefore, obvious that the two shafts of whichever pair happen to be in operative position will be positively rotated from the pinion 37 and the gear 35.

While one pair of shafts and the cutting and creasing elements thereon are being utilized to operate upon the web, the cutting and creasing elements upon the other pair of shafts may be adjusted and re-positioned for the next job or order. In order to facilitate the positioning of the elements upon the shafts, a gage or scale 42 is provided (Fig. 1) which runs longitudinally of the shafts and is supported on brackets 43. Each of the brackets 43 is mounted to slide on and pivot about the rod 44 carried by the housings 7 and 8. The brackets 43 are normally

held in the position shown in Fig. 1 by means of a clamp screw 45 in one of the brackets engaging the rod 44, but when this clamp screw is loosened, the brackets 43 may be swung about the rod 44 to bring the scale 42 adjacent to the cutting and creasing elements on either of the intermediate shafts. When the scale is thus brought into close relation with the cutting and creasing elements on either of the intermediate shafts, said elements may be properly spaced. The corresponding cutting and creasing elements on the cooperating shaft may then be spaced accordingly.

The above-described double or duplex arrangement of the parts for operating on the web of material with means for bringing either set of the parts into operative relation may be applied to other machines than machines of the specific type herein disclosed. So far as this feature is concerned, it is immaterial whether the operating elements upon the shafts are cutting and creasing blades or other elements. Furthermore, various changes may be made in the details of construction as above described without departing from the spirit or scope of the invention, as defined in the accompanying claims.

What I claim is:—

1. Mechanism for operating upon webs of material, comprising a plurality of sets of elements for performing the desired operations on the web, and means for moving all of said elements in the same path to bring any one of said sets of elements into operative position to act upon the web.

2. Mechanism for operating upon webs of material, comprising a plurality of sets of elements for performing the desired operations on the web, said elements being mounted in a unitarily movable series, and means for shifting the position of said series of elements in the same path for bringing any one of said sets of elements into operative position to act upon the web.

3. Mechanism for operating upon webs of material, comprising a plurality of sets of rotary elements for performing the desired operations on the web, and means for moving all of said elements in the same path to bring any one of said sets of elements into operative position to act upon the web.

4. Mechanism for operating upon webs of material, comprising a plurality of sets of cutting and creasing elements for operating upon the web, and means for moving all of said elements in the same path to bring any one of said sets of cutting and creasing elements into operative position to act upon the web.

5. Mechanism for operating upon webs of material, comprising a plurality of pairs of shafts arranged in a vertically movable series, cooperating elements associated with

the shafts of each pair to perform the desired operations on the web, and means for shifting the position of the entire series of shafts to bring one of the pairs thereof into operative position with respect to the web of material.

6. Mechanism for operating upon webs of material, comprising a plurality of sets of rotary elements for performing the desired operations on the web, means for shifting the position of all of said sets of elements, in the same path and as a unit to bring one of the sets into operative position to act upon the web, and driving mechanism operative to rotate the elements of any set which is in operative position.

7. Mechanism for operating upon webs of material, comprising a series of shafts movable as a unit in the same path, said shafts having elements associated therewith for performing the desired operations upon the web, means for shifting the position of the entire series of shafts as a unit for bringing two of the shafts into operative position to act upon the web, and means to adjust the distance between the shafts of certain pairs of the series.

8. Mechanism for operating upon webs of material, comprising a plurality of shafts mounted in a series movable as a unit in the same path and divided into pairs of cooperating shafts, elements associated with the shafts of each pair to perform the desired operations on the web, means for shifting the position of the entire series of shafts as a unit to bring any one of said pairs into operative position, and means to adjust the distance between the two shafts of each pair.

9. Mechanism for operating upon webs of material, comprising a series of shafts, slidable housings in which all of said shafts are mounted, said shafts being arranged in pairs, the shafts of each pair carrying cooperating elements for performing the desired operations on the web, and means to shift the position of said housings in the same path to bring any one of said pairs of shafts into operative position with respect to the web.

10. Mechanism for operating upon webs of material, comprising a series of shafts, slidable housings in which all of said shafts are mounted, said shafts being arranged in pairs, the shafts of each pair carrying co-

operating elements for performing the desired operations on the web, means to shift the position of said housings in the same path to bring any one of said pairs of shafts into operative position with respect to the web, and means to adjust the distance between the two shafts of each pair.

11. Mechanism for operating upon webs of material, comprising a plurality of rotary shafts, vertically/slidable side housings in which all of said shafts are mounted in a single vertical series, said shafts being arranged in pairs with cooperating elements associated with the shafts of each pair for performing the desired operations on the web, means for shifting said housings vertically to bring any one of said pairs of shafts into operative position, and driving means for rotating the shafts of that pair which is in operative position.

12. Mechanism for operating upon webs of material, comprising a plurality of rotary shafts, vertically slidable side housings in which all of said shafts are mounted in a single vertical series, said shafts being arranged in pairs with cooperating elements associated with the shafts of each pair for performing the desired operations on the web, means for shifting said housings vertically to bring any one of said pairs of shafts into operative position, driving means for rotating the shafts of that pair which is in operative position, and means to adjust the position of one shaft of each pair in said housings to vary the distance between the two shafts of each pair.

13. Mechanism for operating upon webs of material, comprising a plurality of sets of elements for performing the desired operations on the web, means for moving said sets of elements in the same path to bring any one of said sets of elements into operative position to act upon the web, and means for locking such set of elements in its operative position.

Signed at Rochester, in the county of Monroe, and State of New York, this 7th day of December, A. D. 1915.

CHAS. R. SEYMOUR.

Witnesses:

THOS. D. PATTON,
GEO. S. GOODELL.