To all whom it may concern:

Be it known that I, ALBERT EDWARD YOUNG, a subject of the King of Great Britain, residing at 134 Hereford street, 5 Christchurch, in the Province of Canterbury and Dominion of New Zealand, have invented and useful Improvements in Means for Folding and Wrapping Newspapers and the Like, of which the following description is a specification.

This invention relates to a machine for use in newspaper offices and the like for folding and wrapping newspapers, periodicals and other printed matter ready for mailing or delivery, its object being the provision of a machine adapted to receive the papers as they come from the press or folder and perform the above operation in a manner similar to that at present carried out by hand.

In order that the nature of the invention and its construction may be fully understood, reference will now be made to the accompanying sheet of drawings in which:

Figure 1.—is a sectional elevation of the machine in which certain of the connecting portions and the drives have been omitted for the sake of clearness. Fig. 2.—is a similar view of a portion of the machine showing on a somewhat enlarged scale the final wrapping operations. Fig. 3.—is a detail view of one of the folding knives and the method of mounting same. Fig. 4.—illustrates a method of operating the knife shown in Figs. 3, 5.—shows a method of operating the cutting-off knife for the wrappers, Fig. 6.—shows a means of actuating the final folding knife, Fig. 7.—illustrates a method of operating the fingers and table employed in holding the wrapped paper while the sealing of the wrapper is effected. Fig. 8.—shows a means of operating the first folding device, and Fig. 9.—illustrates a method of driving the feed roller for the wrappers. Fig. 10.—is a detail view of the carriage 34 and the mechanism controlled thereby. 1 is a suitable framework having a horizontal table 2 adapted to receive the newspapers 3 which have been previously folded in halves. 4 is a knife which descends upon the paper and causes it to pass between a pair of rollers 5 so as to fold it, in the manner usual in folding machines, into quarters. The paper after emerging from between the rollers 5, passes downward guided by the belts or tapes or the like means 6 and the shield or baffle 7, and is received in a vertically inclined position by the clips or the like 8. Meanwhile the paper 9 which is designed to form the wrapper and is mounted in roll form upon the framework above, is fed down between the face of the folded paper and a second pair of rollers 10. A second knife 11 adapted to slide in a plane approximately at right angles to the surface of the paper 9, now comes into operation and forces the paper 3 and wrapper 9 between the rollers 10 so as to fold such paper 3 upon itself for about a third of its height, while at the same time a shearing device severs the wrapper 9 at the required length. According to the drawings the said shearing device comprises a knife 12 mounted upon a spindle 13 and adapted to operate in conjunction with a similar fixed knife 14, mounted upon the framework at the other side of the paper, so as to shear the paper between them, but obviously this object may be attained by the use of a guillotine or other known device. The said folding knife 11 illustrated in Fig. 3 is cleated in the middle for a distance approximating to the width of the wrapper 9 in order that in the event of the machine being left running without receiving any newspapers, the wrappers will not be caused to pass between the rollers but will simply drop clear of the machine as they are cut off.

After causing the newspaper to pass between the rollers 10; as above described the knife 11 carries such newspaper and its wrapper with the short folded side of the paper uppermost, between the table 15 and the plate 16, which is loosely suspended from the bracket 17 so that as the paper and wrapper are passed beneath it, such plate will be forced upward slightly so as to place its weight upon the paper and wrapper and hold them firmly down upon the table 15. The knife 11 continues to travel in the same direction and after causing the paper and wrapper to emerge from beneath the plate 16, carries such paper and wrapper to a position at which they are received by the clips 18 mounted upon the extremity of the table 15. The knife 11 is then withdrawn and the knife 19, working at right angles to the surface of the table 15, descends upon the paper and wrapper and
passes them downward between a pair of rollers 20, thus folding the remaining third upon the paper again while at the same time placing the portion of the wrapper, which was uppermost, within the last fold. In order to permit of this being done, the wrapper was cut with a sufficient length to allow of its being gripped by the knife 19.

As the paper and wrapper were being forwarded by the knife 11 to the position to receive the final fold, and again as they were passing between the rollers 20, as above described, the portion of the wrapper upon the underside received a smear of gum or paste from an endless band 21, running around one of the rollers 20 and through a reservoir 22, so as to prepare such wrapper for sealing. The folded paper and its wrapper are delivered from the rollers 20 vertically or nearly so with the lower edge resting upon a stop 23 and with the free end of the wrapper 9 projecting upward above the upper edge of the paper. In this position it is received by a series of fingers 24 which bear against the side of the paper at which the gummed portion of the wrapper is situated, while upon the other side is arranged a hinged flap 25 which depends from one of the rollers 20 or other convenient point upon the framework above and is adapted to exert a slight pressure against the wrapper so as to press the latter against the paper. For this purpose the said flap 25 may be arranged at a slight angle as shown so as to bear against the wrapper by means of gravity or it may be provided with a suitable spring. The said stop 23 is provided along its edge with a flange 29 which is spring controlled so that when it receives the paper and wrapper as above described such flange will project upwardly. When however the paper is turned over by the fingers 24, such flange 29 will give under the pressure and assume a position with its upper edge flush with the top of the stop 23, as clearly shown in Fig. 2. The said fingers 24 are all keyed in line upon a suitable shaft 26 so that when in position to receive the paper in the described manner, they will project upwardly therefrom (as shown in Fig. 1). An interval is allowed between the fingers 24 in the middle of the row to permit of the hinged flap 25 passing between them. Having thus delivered the folded paper and wrapper upon the stop 23, the knife 19 is withdrawn.

As the paper was being passed downward from the rollers 20 it pressed against a projection 27 mounted upon an upwardly projecting spring tongue 28 which gave sufficiently to allow the paper to pass and then sprang back into its normal position again so that the projection 27 locked upon the upper edge of the paper and so prevented the latter from being carried up by the knife 19 as it was withdrawn. The mounting of the spring tongue 28 upon the framework is adjustable so that the height of the projection 27 with respect to the stop 23 may be varied to suit various widths of folds.

The paper and wrapper, having reached the position as described, the shaft 26 is then rocked so as to cause the fingers 24 to turn such paper and its wrapper over toward the hinged flap 25 which is thereby forced to swing outwardly so as to permit of the paper and wrapper turning sufficiently to bring the gummed portion of the wrapper upward (as shown in Fig. 2). A table 29, mounted upon and operated by a special shaft 30, now comes into operation and presses the paper upward against the fingers 24 so as to hold the folded paper firmly together, as shown in full lines Fig. 2. A shaft 31 is now caused to turn so that the cam 32 keyed upon it bears against the back of the flap 25 and forces the said flap back to its original position again. The lower edge of the flap 25 during the latter operation carries the free end of the wrapper and wipes it across the gummed portion as shown in dotted lines Fig. 2 thus effecting the sealing after which the table 29 is withdrawn so permitting the wrapped paper to fall clear of the machine.

In cases where the machine is intended to wrap papers which have already been folded in quarters or if paper of smaller size or periodicals or other small matter, is to be wrapped the table 2, the knife 4 and rollers 5 may be dispensed with and the matter may be fed directly into the clips 8 in readiness for the succeeding operation.

The various parts are all actuated from a common shaft 33 and the movements are all so timed that each comes into operation at the required moment. In effecting this purpose, intermediate mechanism of well known types may be employed so as to provide each with a positive movement. As a selection of these may easily be made by anyone skilled in the mechanical arts, the following description is to be regarded as an example rather than as confining the invention, to the employment of such means.

The knife 11 (illustrated in Fig. 3) is mounted upon a carriage 34 which is adapted to slide upon an inclined bed 35 provided upon the framework 1. The method of mounting the said knife 11 upon its carriage is adjustable in order to permit of the knife being set so as to come into operation at the required moment. According to the drawings such mounting consists of clamping the lateral projections of the knife 11 between nuts 34* screwed upon the side rods 34 of the carriage 34, so that the setting of the knife may be adjusted by varying the positions of the nuts upon the rods.

The movement of the carriage 34 is ef.
fected by means of a cam 36 which is keyed upon the common shaft 33. The said cam 36 is formed with a continuous groove or race 37 extending around one of its lateral faces and adapted to receive a lug or roller 38 mounted upon the forward end of the carriage 34 (as clearly illustrated in Figs. 3 and 4). It will be understood therefore that as the cam 36 is rotated it will cause the carriage 34 to reciprocate upon its bed and the contour of the race is such as to effec a quick return movement of the knife 11 after the completion of its working stroke. As an alternative method of adjusting the setting of the knife 11, for that described above, provision may be made for varying the position of the lug or roller 38 longitudinally upon the carriage 34.

The knife 19 is connected at the top to rods 39 shown in Fig. 6 adapted to work in slides 40 at either side of the framework 1, reciprocal motion being transmitted to such rods 39 by means of the rocking lever 41 fulcrumed upon the framework 1 at 42 and actuated by the pull and push cam 43, keyed upon the shaft 33 (as shown in Fig. 6).

The method of operating the shaft 30 carrying the table 29 and the shaft 26 carrying the fingers 24, is illustrated in Fig. 7, according to which the shaft 30 is provided with a crank 44 and the shaft 26 with the crank 45. These cranks are coupled together by a link 46 and are also connected by a common link 47 to one end of a lever 48 which is fulcrumed upon the framework 1 at 49 and is operated in one direction by the cam 50 bearing upon its other end, while the return movement of such lever is accomplished by the spring 51 which imparts a downward tendency to the end at which the link 47 is connected (as shown in Fig. 7). It will be understood that as the cam 50 depresses one end of the lever 48 its other end will rise, thereby causing the cranks to turn so as to bring the fingers 24 and table 29 together in the manner described.

The knife 4 (see Fig. 8) is mounted upon a bell crank lever 52 which is fulcrumed upon the framework at 53 and connected to the end of the sliding rod 54. The other end of the said rod 54 is adapted to bear against the periphery of the cam 55 keyed upon the shaft 33. It will be seen that while the large radius of the cam 55 is presented to it, the rod 54 will be held upward thereby maintaining the knife in the upward position. When however the cam has turned so as to bring its smaller radius beneath the tip of the latter it will permit the knife 4 to descend by means of its own weight. The paper 9 forming the wrapper is fed down from the roll by means of the feed roller 56, an idler roller 57 (Fig. 1) mounted in slotted bearings being adapted to bear by means of its own weight upon the paper 9 and so keep it in engagement with such feed roller 56. The said roller 56 (Fig. 8) is caused to revolve continuously by means of the shaft 58 which is connected at its lower end with the shaft 33 by means of bevel gearing 59 and at its upper end with the roller 56 by means of similar gearing 60. The rollers 5 are provided with the intermeshing gears 61 (Fig. 1) and rotary motion is transmitted to one of such rollers from the roller 56 (Fig. 8) through the shaft 62 and bevel gears 63 and 64. The knife spindle 13 (Fig. 5) is also operated from the roller 56 by means of the shaft 65 and bevel gears 66 and 67. The shaft 31 (Fig. 2) carrying the cam 32 is provided with a crank or arm 68 to which is connected the cord or connection 69 (Figs. 3 and 10) the other end of which is secured through the spring 70 to the carriage 34 so that as the carriage 34 travels forward the cam 32 will operate the flap 25 in the manner described. The return movement of the shaft 31 is effected by means of the spring 90 71 connected to the crank 68 and to a suitable point upon the framework 1.

I claim:

1. A machine for the purpose indicated, comprising, in combination, a suitable framework, a first pair of folding rollers, a second pair of folding rollers, means for feeding the newspaper into a position in front of the first pair of rollers, means for feeding the wrapper web downward into position between the newspaper and the first pair of rollers, a knife adapted to pass the newspaper and wrapper between said first pair of rollers so as to fold such newspaper upon itself for about a third of its height, and to carry the newspaper and wrapper on into a position over the second pair of rollers in readiness for further folding, so that the newspaper will lie with its short folded side uppermost within the wrapper and with the ends of such wrapper extending beyond the upper and lower edges of such newspaper, means for severing the web as said newspaper passes between said first pair of rollers, a second knife adapted to descend upon the projecting upper edges of the wrapper, pass the newspaper and wrapper between said second pair of folding rollers in such a manner as to fold the remaining third upon such newspaper, and to carry newspaper and wrapper on into a position for further treatment.

2. A machine for the purpose indicated comprising in combination a suitable framework, means for folding the newspaper, a pair of folding rollers, means for feeding the folded newspaper thereto, means for feeding the wrapper web into position, a knife adapted to pass the newspaper and wrapper between said rollers so as to fold
such newspaper upon itself for about a third of its height, means for severing the wrapper as said newspaper enters said rollers, a second pair of folding rollers, a second knife adapted to descend upon said newspaper and wrapper after they have emerged from said first rollers and cause said newspaper and wrapper to pass between said second pair of rollers so as to fold the remaining third upon said newspaper while at the same time placing the portion of the wrapper which was uppermost within the last said fold, a gumming device adapted to come in contact with said wrapper so as to prepare it for sealing, a stop adapted to receive said folded newspaper upon edge as it passes from the second pair of rollers, a series of fingers adapted to bear against one side of the newspaper and turn the latter over upon its side, a hinged flap adapted to bear against the wrapper at the opposite side and to wipe the free end of the wrapper across the gummed portion thereof so as to effect the sealing when the newspaper and wrapper are turned over, and a table adapted to hold the newspaper upward against the fingers while the sealing is being performed, substantially as described and shown in the drawings.

3. A machine for the purpose indicated, comprising, in combination, means for folding an article within a wrapper with a portion of said wrapper projecting beyond the article to form a free end, means for applying gum to a portion of said wrapper, a stop for receiving said article from said means, an upwardly movable table, a shaft on which said table is mounted, a plurality of pivoted fingers adapted to press the wrapped article upon said table, a shaft on which said fingers are mounted, means for simultaneously actuating said shafts whereby said table will move upwardly at the same time that said fingers move downwardly, and a hinged flap for wiping the free end of the wrapper across the gummed portion thereof.

4. A machine for the purpose indicated, comprising, in combination, means for folding an article within a wrapper with a portion of said wrapper projecting beyond the article to form a free end, means for applying gum to a portion of said wrapper, a stop for receiving said article from said means, an upwardly movable table, a plurality of pivoted fingers adapted to press the wrapped article upon said table, a hinged flap for wiping the free end of the wrapper across the gummed portion thereof, a sliding frame, a shaft, means controlled by said sliding frame for rotating said shaft, and a cam mounted on said shaft and operatively engaging said hinged flap, whereby the latter will be actuated.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ALBERT EDWARD YOUNG.

Witnesses:

Percy Richmond Climie,
Cyril Carlyon Cochet.