To all whom it may concern:

Be it known that we, DANA O. SEWALL, GEORGE P. MILLIKEN, and SAMUEL B. HANNAFORD, citizens of the United States, residing at Walpole, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in a Machine for Breaking Strip Material, of which the following description, in connection with the accompanying drawings, is a specification, and reference characters on the drawings indicating like parts in the several figures.

This invention relates to a machine for breaking strip material into short lengths and will be herein disclosed as embodied in a machine designed especially for breaking a web of cotton batting into short pieces. In the manufacture of that class of bandages, sanitary napkins and the like in which a cotton pad is used, it is preferable to break the web of cotton batting instead of cutting it for the purpose of producing this pad since the breaking operation produces a pad better suited to these uses. It is the chief object of the present invention to devise a machine with which this breaking operation can be performed quickly and economically and which will break the cotton into substantially predetermined lengths. The invention also provides means for folding the web of cotton prior to the breaking operation so that pads of the desired thickness may be readily produced.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a side elevation of a machine constructed in accordance with the present invention;

Fig. 2 is a plan view of the machine shown in Fig. 1;

Fig. 3 is an end view of the folding devices, the support for these devices being shown in cross section;

Fig. 4 is a cross sectional view through the folding apparatus showing the manner in which the web of cotton is folded; and

Fig. 5 is a cross sectional view of a folded web of cotton.

The machine shown comprises a pin 2 supported on a suitable base 3 and a table 4 rotating about said pin, the table being designed to support one end of a roll of cotton batting 5 centered on the pin 2. A spring 5 bearing on the table 4 prevents too free rotation of the table. As the web W is unwound from the roll R it is led over a guide pin 6, Fig. 2, and thence through a series of stationary folding fingers 7 mounted on a table 8, these fingers operating, as will readily be understood by those skilled in this art and as illustrated in Fig. 4, to fold the web into a series of superposed layers.

The folded web passes directly from the folding devices 7 into the cotton breaking apparatus comprises two pairs of rolls. The forward pair comprises upper and lower rolls 9 and 10, respectively, while the rear pair comprises upper and lower rolls 11 and 12. The two lower rolls 10 and 12 rotate on shafts 13 and 14, respectively, which are supported in stationary bearings in the frame 15. The upper rolls 9 and 11 rotate on shafts 16 and 17, respectively. The shaft 16 is supported in two blocks 18—18, Fig. 2, mounted in vertical guideways formed in the opposite sides of the frame 15, while the shaft 17 is supported in similar blocks 19—19. These bearing blocks are yieldingly depressed by springs, 8, indicated at 20, and the upward movement of each block is limited by an adjustable stop screw 21 that is supported in the frame.

The machine may be driven either by hand or power and the drawings show the shaft 13 equipped with a handle 22 by means of which it may be rotated. It will be understood, however, that this handle can be replaced by a pulley, sprocket wheel, or other means by which power can be transmitted thereto from any convenient source. The shafts 13 and 16 project beyond the frame at the opposite side of the machine from the crank 22 and they are geared together, the gear on the shaft 13 being shown in Fig. 2 at 23, and both gears being indicated by dotted lines in Fig. 1. The shafts 14 and 17, of the rear pair of rolls, also are geared together, the gear on the lower shaft 14 being shown at 24, Fig. 2. The lower shafts 13 and 14 are belted together and for this purpose they have fixed thereto grooved pulleys 25 and 26, respectively, these pulleys...
being connected by a round belt 27. In other words, the forward pair of rolls are driven directly while the rear rolls receive their power from the lower roll of the forward pair. The gears connecting the two rolls of each pair are provided with long teeth to enable the rolls to have a relative movement toward and from each other without disturbing their driving connection.

It will now be understood that when the web of cotton is unwound from the roll B and properly placed in the stationary folding fingers 7, the end of this web being placed between the rolls 11 and 12 and power being applied to the shaft 13, the rolls will exert a feeding movement on the web which will draw it through the folding fingers 7, the folding being performed by this advancing movement of the web. If no other mechanism were provided the web would simply be folded and fed through the machine.

For the purpose of enabling the rolls to break this web into short lengths, a disk 29 is secured to the shaft 14 at one side of the frame and a pin 29 is secured in this disk. A lever 30 is fulcrumed on the folding frame at 31 and is long enough to bear at one end on a hub 32 that rotates with the shaft 16. The other end of this lever may move into or out of the path of movement of the pin 29. A spring 33 acts on the lever 30 to hold it in engagement with the part 32.

It will be seen from an inspection of Fig. 1 that when there is no material between the upper and lower rolls, the roll 9 will be in a lower position than shown in this figure and a spring 33 at this time will hold the left-hand end of the lever 30 out of the path of rotation of the pin 29. As soon, however, as a web W of cotton is fed into engagement with the forward pair of rolls, the upper roll 9 will be raised into substantially the position shown in Fig. 1 and both pairs of rolls will operate to feed the web W until the pin 29 strikes the end of the lever 30. This stops the rotation of both of the rear rolls 11 and 12 due to the fact that they are geared together. Consequently they stop the feeding movement of the strip at points 35 behind their engagement with said strip while the forward pair of rolls continues to advance this strip. The result is to break the strip at a point between the front and rear pairs of rolls. The forward rolls immediately feed this broken piece out from between them, whereupon the upper roll 9 drops into engagement with its companion roll. The spring 33 then moves the lever 30 out of engagement with the pin 29 thus permitting the rear rolls to advance the web of cotton into engagement with the forward rolls again. The operations above described are then repeated.

It will be understood that the belt 27 slips on the pulleys while the rotation of the rear pair of rolls is stopped. If desired these rolls may be corrugated or their peripheral surface may be covered with some material adapted to give them a better grip on the web of cotton.

The invention thus provides a very simple machine for breaking a web of cotton into short lengths, and, if desired, for folding the web prior to the breaking operation. The machine operates very rapidly and produces pads of a substantially predetermined length.

What is claimed is new:
1. In a machine of the character described, the combination of mechanism for feeding a strip of material and means for engaging said strip at a point behind the point of engagement therewith of said feeding mechanism to stop the feeding movement of said strip momentarily and thereby cause the feeding means to break the strip.

2. In a machine of the character described, the combination of mechanism for feeding a strip of material, means for engaging said strip at a point behind the point of engagement therewith of said feeding mechanism to stop the feeding movement of said strip momentarily and thereby cause the feeding means to break the strip, said means being controlled by said mechanism.

3. In a machine of the character described, the combination of means for feeding a continuous strip of material, and automatic means operative under predetermined conditions to engage said strip behind said feeding means and stop the feeding movement of said strip momentarily, whereby the feeding means will break the strip.

4. In a machine of the character described, the combination of two rolls for engaging a strip of material at points spaced along the strip, means for supporting said strip of material for engagement therewith of said rolls, means for rotating the forward roll to feed the strip, and automatic means for stopping the other roll, whereby the feeding action exerted on the strip by the forward roll will break the strip.

5. In a machine of the character described, the combination of mechanism for feeding a strip of material, means for engaging said strip at a point behind the point of engagement therewith of said feeding mechanism to stop the feeding movement of said strip and thereby cause the feeding means to break the strip, said means being controlled by said mechanism, and said means being operative after the breaking of said strip to advance the strip into engagement with said feeding mechanism.

6. In a machine of the character described, the combination of a pair of rolls for engaging a strip of material and feeding it, and means under control of one of said feeding
rolls for engaging said strip behind said feeding rolls and stopping the feeding movement of the strip.

7. In a machine of the character described, the combination of a pair of rolls for engaging a strip of material and feeding it, and means operative automatically under predetermined conditions to engage said strip of material behind said feeding rolls and stop the feeding movement of the strip to cause said rolls to break the strip, said means being operative after the breaking of said strip to advance the strip into engagement with said rolls.

8. In a machine of the character described, the combination of two pairs of feed rolls for engaging a strip of material at points spaced apart along said strip and feeding the strip, and automatic means for stopping the rear pair of rolls periodically, whereby the feeding movement of the forward rolls will break the strip.

9. In a machine of the character described, the combination of two pairs of feed rolls for engaging a strip of material at points spaced apart along the strip and feeding the strip, and means dependent on the presence of the strip of material between the forward rolls for stopping the feeding movement of the rear rolls and thereby causing the strip to be broken.

10. In a machine of the character described, the combination of two pairs of feed rolls for engaging a strip of material at points spaced apart along said strip, means for driving both pairs of said rolls to feed the strip, and means controlled by the forward pair of rolls for stopping the rear pair of rolls periodically.

11. In a machine of the character described, the combination of two pairs of feed rolls for engaging a strip of material at points spaced apart along said strip, means for driving both pairs of said rolls to feed the strip, and means operated by the relative movement of the forward rolls caused by the entrance of said strip between the latter rolls to stop the rear rolls.

12. In a machine of the character described, the combination of two pairs of feed rolls for engaging a strip of material at points spaced apart along said strip, means for driving the forward pair of rolls, a belt connection between the two pairs of rolls for driving the rear rolls, and connections between the two pairs of rolls for causing a predetermined relative movement of the forward rolls to stop the rotation of the rear rolls.

13. In a machine of the character described, the combination of two pairs of feed rolls for engaging a strip of material at points spaced apart along said strip, means for driving the forward pair of rolls, a belt connection between the two pairs of rolls for driving the rear rolls, a stop carried by one of the rear rolls, and a lever arranged to be moved into and out of the path of movement of said stop by changes in elevation of one of said forward rolls.

14. In a machine of the character described, the combination of means for folding a strip of sheet material, and means for breaking said folded strip into short lengths, said breaking means being operative to feed said strip through said folding means.

15. In a machine of the character described, the combination of stationary folding devices for acting on a strip of sheet material to fold it into a plurality of superposed layers, and means for breaking said folded strip into substantially predetermined lengths, said breaking means being operative to feed said strip through said folding devices.

In testimony whereof we have signed our names to this specification.

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