Nov. 26, 1929. G. SPIESS 1,737,204

MECHANISM FOR IMPARTING INTERMITTENT MOTION TO BANDS OR WEBS

Filed May 9, 1925

Fig. 1.

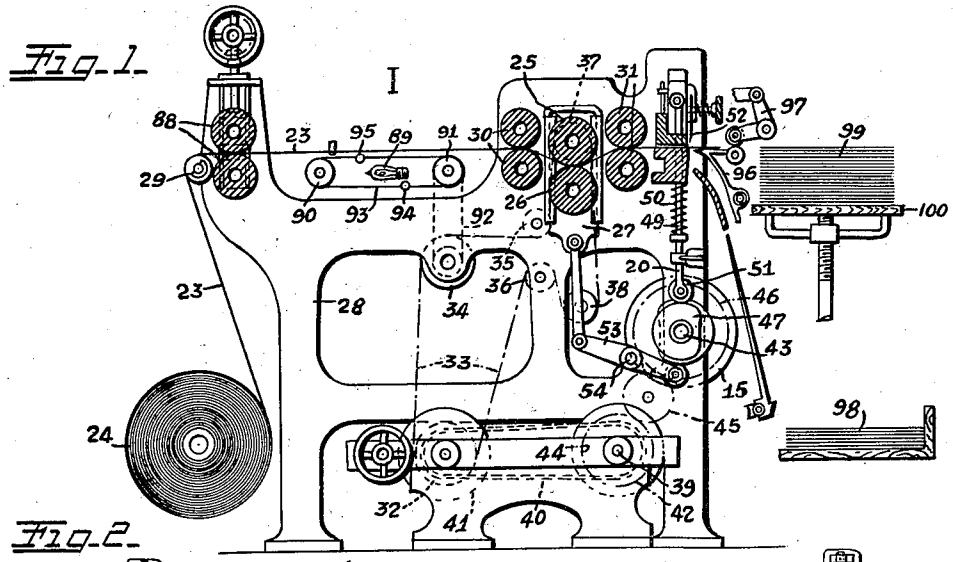


Fig. 2.

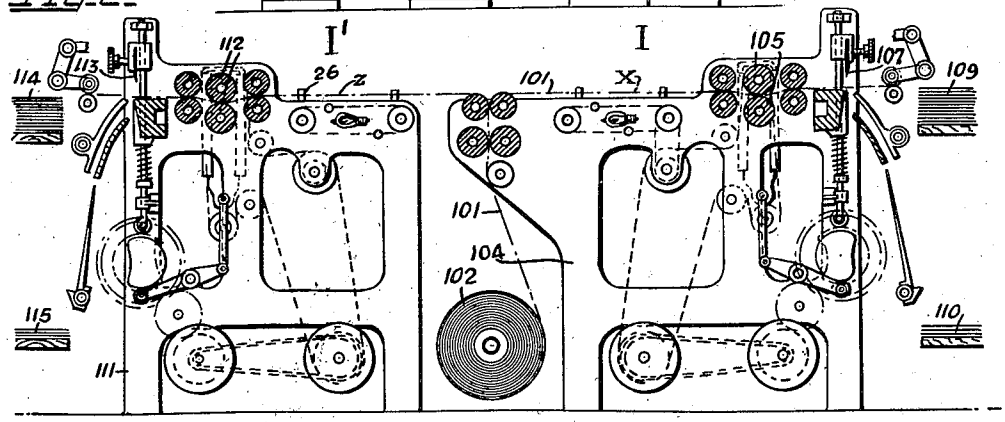
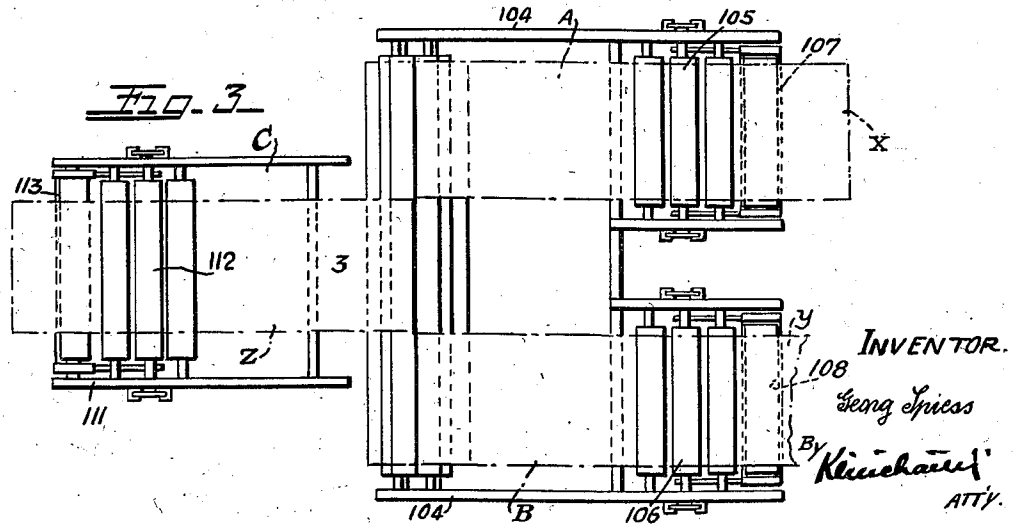


Fig. 3.



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MECHANISM FOR IMPARTING INTERMITTENT MOTION TO BANDS OR WEBS

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My invention relates to mechanism for imparting intermittent motion to bands or webs which are fed through a machine by a continuously operated feed, the motion being periodically interrupted in order to subject the bands to some treatment such as for instance cutting, embossing, printing or the like.

While the motion of the bands or webs is arrested while they are acted upon by the machine, it is nevertheless desirable to feed them continuously in order to avoid the throwing out of the machine during each operation so as to obtain steady running of the machine and to avoid the occurrence of undue stresses in the web or band. It has been proposed to solve the problem of periodically arresting the bands or webs without interfering with their continuous feed motion by moving the feed mechanism in opposite direction to the normal direction of feed during the periods of operation of the machine and to vary the speed mechanism. To this end the feed rollers were mounted on a slide or rocking lever which is operatively connected with a similar part equipped with a tension roller for regulating the tension of the belt which drives the feed rollers. Motion is imparted to the belt from a shaft rotating at uniform speed. When the feed rollers are displaced the tension roller is displaced also so that the tension of the belt and the speed of the feed rollers are varied.

In a device of this kind the band or web must embrace one half of the circumferential surface of one of the feed rollers. This involves the drawback that the reel from which the band or web is unwound, must either be arranged at the rear end of the machine or, if at the front end, the band or web must pass over guide rollers at the rear end of the machine. In the latter case the portion of the band which extends across the machine, is inconveniently long so that undesirable variations in tension will occur and the repeated reversing or deflecting of the band requires continuous attention and regulation.

The necessity of arranging the tension roller for the driving belt in front of the feed rollers and of moving the feed and guide rollers in opposite direction to the feed, requires a machine of considerable length which interferes with the proper attendance to the machine. These drawbacks are overcome in my invention by displacing the feed rollers transversely to the direction of feed.

By adapting such a feed mechanism to machines for cutting bands or webs of paper, cloth or the like, for instance, to machines for cutting sheets of predetermined size from a continuous web of paper of the length of the machine is much reduced. Another advantage inherent in this feed mechanism consists therein that the place of inspection can be arranged between the longitudinal and the transverse cutters.

Heretofore the place of inspection was arranged in front of the longitudinal or at the rear of the transverse cutter. If it is arranged in front of the longitudinal cutter, the operator has to survey the entire width of the web. As the velocity of the web is considerable defects are often overlooked. Moreover as a rule the operator is not able to ascertain the particular strip cut from the web by the longitudinal cutter in which he has noticed a defect, and it is therefore necessary to direct all the sheets in the row of sheets in which the defect was noticed, to the "rejected" pile and to search that pile for the good sheets which have mixed with the defective ones.

If, on the other hand, the place of inspection is arranged at the rear of the cutters, where the sheets have been cut to size, the inspection is very tiring to the eye as the sheets do not move in continuous succession but with interstices which are particularly large in machines provided with transverse shearing cutters. In consequence thereof it is impossible for the operator to attend to his duty for several hours in succession.

In existing machines, in which the place of inspection is at the rear of the transverse cutter, conveyors are required for carrying the sheets through this place and the length of the machines is considerably increased. In the novel machine such conveyors are not required inasmuch as, with the place of in-

spection between the longitudinal and transverse cutters, the finished sheets can be deposited on the "good" and "rejected" piles immediately at the rear of the transverse cutters.

Machines equipped with my improved feed mechanism are particularly suitable for combination into units in which the web is cut into strips which are then cut into sheets. Such unit may comprise three machines, two of which are arranged in parallel, while the third machine is disposed opposite the two others, facing the interstice between the two. A longitudinal cutter divides the web into three strips. The two outer strips are cut into sheets on the first two machines which are arranged in parallel and the third or central strip is deflected in opposite direction and cut into sheets by the third machine. It will be understood that any number of machines may be combined into units in this manner and all the machines of a unit may cut sheets of the same size or the several machines of a unit may cut sheets of different sizes from the strips supplied to them.

A further advantage resides in the fact that in machines of the type last referred to it is possible to replace the rotary cutters by shearing cutters which are preferable inasmuch as they produce a cleaner cut.

In the drawings affixed to this specification and forming part thereof a machine embodying my invention is illustrated diagrammatically by way of example. In the drawings

Fig. 1 is a sectional elevation of my machine,

Figs. 2 and 3 illustrate the combination of three machines into a unit, two of the machines being shown in section in Fig. 2, and

Fig. 3 is a plan view of the complete unit.

Referring now to the drawing, the web 23 is unwound from a reel 24 by the feed rollers 25, 26 which are carried in a slide 27 guided in the frame 28. The web 23 passes over a single guide roller 29 and pairs of guide rollers 30, 31, which are mounted in the frame 28.

Motion is imparted to the upper feed roller 25 by a pulley 32 through the medium of a belt 33 passing over guide rollers 34, 35, 36, a pulley 37 on the shaft of the upper feed roller 25 and a tension pulley 38 in the slide 27.

The shaft of the pulley 32 is connected with a parallel shaft 39 through the medium of a belt 40, and conical pulleys 41, 42. The shaft 39 imparts motion to a cam shaft 43 through the medium of gearing 44, 45 and 46. Two cams 47 and 48 are secured on the shaft 43. The cam 47 controls a rod 49 equipped with a spring 50 and a roller 51 which operates the cutting mechanism 52 and the cam 48 controls a double-armed lever 53 fulcrumed in the frame 28 at 54, the other end of this lever being connected to the slide 27.

The operation of the cutting mechanism 52 and of the slide 27 is so timed that the feed motion of the web 23 is arrested for each cutting stroke.

88 is a rotary cutter arranged at the entrance of the machine which subdivides the web 23 into a plurality of parallel strips. A place of inspection is provided at I where the strips are exposed to the light of an incandescent bulb 89 or some other suitable source of light. Pulleys 90, 91 are arranged in front and at the rear of said bulb, the rear pulley 91 being driven by a belt 92 from a pulley on the shaft of the pulley 34 or 80. Endless belts 93 are placed on the pulleys 90, 91 and two cross bars 94, 95 are secured to these belts. The shadows of these bars mark on the web 23 the length of a sheet as cut by the transverse cutter 52 and thus indicate to the operator the field of inspection. If the operator notices a defect in the field thus marked he operates a deflector 96, 97 at the rear of the cutter 52 which directs the row of sheets including the defective sheet onto a "rejected" pile 98.

The good sheets pass straight on and are placed on a pile 99 which is supported on an adjustable plate 100.

This method of inspection involves the drawbacks mentioned in the introduction, viz that it is difficult to inspect the several sheets in a row with the necessary thoroughness and that it is impossible to single out a defective sheet from a row.

These drawbacks are eliminated in the unit illustrated in Figs. 2 and 3. This unit comprises two machines A and B arranged in parallel and preferably in a common frame 104, and a third machine C which is placed opposite the two first machines and faces the interstice between the machines A and B.

The web 101 from the reel 102 is cut into three parallel strips x, y, z, by a rotary cutter 103 in the frame 104. The two outer strips x and y are conducted over guiding rollers which are similar to those described with reference to Fig. 1, and are finally engaged by pairs of feed rollers 105 and 106, respectively. The rollers are supported in a slide which is operated as described with reference to Fig. 1. Each strip is inspected at I and cut into sheets by transverse cutters 107, 108 and the finished sheets are directed to "good" and "rejected" piles 109 and 110, respectively. The means for deflecting the sheets are similar to those described with reference to Fig. 1 but it will be understood that in this case defective sheets will be deflected separately. The means for operating the several parts of the machines A B and C also resemble those described with reference to Fig. 1 and need not be detailed.

The third or central strip z is engaged by

the feed rollers 112, 112 of the third machine C, the frame of which is indicated at 111. A transverse cutter 113 cuts sheets from the strip z which has been inspected at I' and the finished sheets are deposited on "good" and "rejected" piles 114 and 115.

The frame 111 of the machine C is preferably adapted to be displaced in parallel to the frame 104 of the machines A and B so that the frame can be adjusted in accordance with the width of the web to be cut into strips. The several machines may be operated at various rates of feed so that it is possible to simultaneously cut sheets of various sizes from the same web. The inspection of the several strips is effected without unduly straining the eyes of the operator.

It is not necessary to arrange the several machines of the unit at the same level or in immediate vicinity, they may be arranged some distance apart and even in various rooms or stories as required by the further treatment of the sheets.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

I claim:—

1. Mechanism for imparting intermittent motion to bands or webs comprising a frame, a slide guided in said frame, feed rollers rotatably mounted on said slide, means for rotating said feed rollers and means for imparting reciprocating motion to said slide.

2. Mechanism for imparting intermittent motion to bands or webs comprising a frame, a slide guided in said frame, feed rollers rotatably mounted on said slide, a belt drive for rotating said feed rollers, a tension pulley on said slide and means for imparting reciprocating motion to said slide.

3. A mechanism for imparting intermittent movement to bands or webs comprising a frame, a support adapted to reciprocate with respect to said frame, feed rollers rotatably mounted in said support, means for rotating said feed rollers, and means for imparting reciprocating movement to said support.

4. A mechanism for imparting intermittent movement to bands or webs comprising a frame, a support adapted to reciprocate with respect to said frame, feed rollers rotatably mounted in said support, a belt drive for rotating said feed rollers, a tension pulley on said support, and means for imparting reciprocating movement to said support.

In testimony whereof I affx my signature.

GEORG SPIESS.