

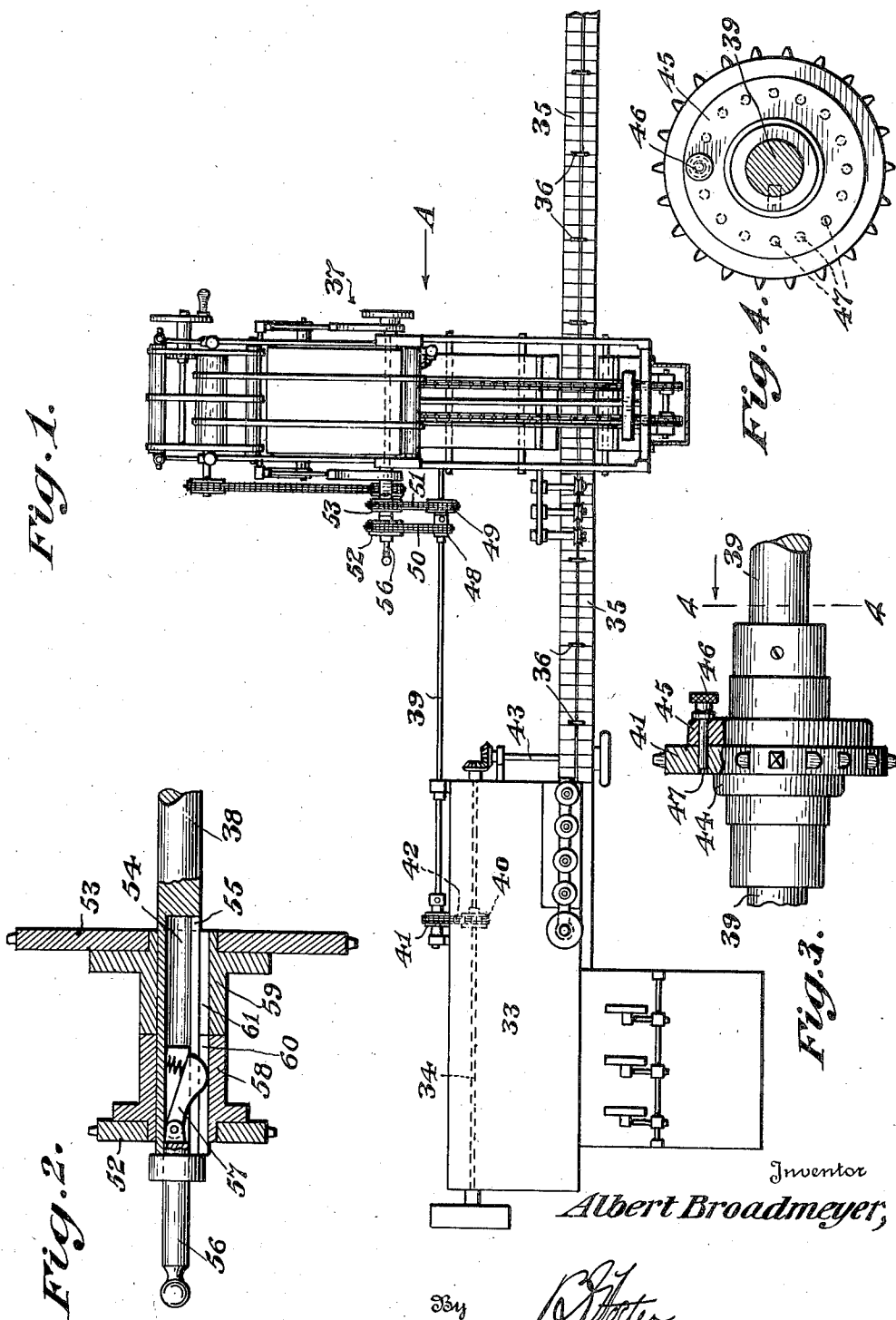
Dec. 22, 1936.

A. BROADMEYER

2,065,487

SHEET FEEDING APPARATUS

Filed Oct. 31, 1932



Inventor
Albert Broadmeyer,

By

Robert

Attorney

UNITED STATES PATENT OFFICE

2,065,487

SHEET FEEDING APPARATUS

Albert Broadmeyer, Harrisburg, Pa., assignor to
W. O. Hickok Manufacturing Company, Har-
risburg, Pa., a corporation of Pennsylvania

Application October 31, 1932, Serial No. 640,570

8 Claims. (Cl. 270—37)

In connection with stapling or other book-binding mechanism, it is the practice to collect the signatures or sheets on a "saddle" or conveyor, which carries the collected signatures to the stapling or binding mechanism. It is the common practice to place these signatures successively on this conveyor by hand.

It is the primary object of the present invention to provide mechanism for automatically feeding the sheets to such a saddle or conveyor and to provide driving means that will synchronize or operate in properly timed relation with the conveyor and binding mechanism. The apparatus is peculiarly useful in connection with the feeding of covers for pamphlets and the like, and may therefore be employed as an adjunct to the manual feeding of the sheets or pages enclosed by such covers.

In the accompanying drawing:

Figure 1 is a plan view in general outline showing the novel assemblage of the cooperating mechanisms.

Figure 2 is a detail perspective view of the clutch for connecting the change speed gearing of the drive shaft.

Figure 3 is a detail elevation partly in section of the means for varying the relations of the binding and conveyor mechanisms with respect to the feeding mechanism.

Figure 4 is a sectional view on the line 4—4 of Figure 3.

Referring initially to Figure 1, a book-binding machine in the form of stapling mechanism is shown generally at 33, and may be of any well-known character. It is provided with a drive shaft 34 which positively operates the stapling or other binding mechanism. Extended from one end of the machine is a saddle in the form of an endless conveyor 35, the upper stretch of which moves toward the machine 33 for carrying thereto assembled sets of signatures in the form of sheets or leaves in a manner well understood. This conveyor is provided at intervals with fingers 36, between which the sets are placed, these serving not only to separate the individual sets, but to positively move the same into proper position to be stapled or otherwise secured together. In the present embodiment of the invention a feeding mechanism 37 is provided specifically intended to place on the saddle between the fingers 36 the covers that are to enclose the signatures already placed thereon.

The initial driving member for this feeding apparatus is a drive shaft 38, and in order that the feeding mechanism shall at all times operate in

predetermined timed relation with the conveyor 35 and the binding mechanism 33 a shaft 39 is provided. This shaft in the present instance is positively driven from the drive shaft 34 of the machine 33 by a sprocket wheel 40 on the shaft 34, a sprocket wheel 41 on the shaft 39, and a sprocket chain 42 connecting the two sprocket wheels. It will be understood that the conveyor 35 is positively driven in timed relation with the mechanism of the machine 33, and consequently as hereinafter explained with the feeding mechanism by a shaft 43 geared to the shaft 34. Experience, however, has demonstrated that in order to properly feed different sheets to the conveyor at the proper time, while all the mechanisms must operate in a predetermined timed relation, the relative time at which one operates with respect to the other must at times be altered and therefore in the present embodiment the driven sprocket wheel 41 on the shaft 39 and as illustrated in Figures 3 and 4 is journaled on said shaft 39 between collars 44 and 45 fixed to said shaft 39. One of these collars, as 45, is provided with a pin 46 which is adapted to be engaged in any of an annular series of openings 47 formed in the sprocket wheel. Thus, it will be evident that if the pin 46 is disengaged from the sprocket wheel, and either the shaft 39 or the drive shaft 34 is rotated, their relative positions are changed, but when the sprocket wheel 41 is again coupled to the shaft 39, the two shafts are positively connected, so that their relative rates of speed are unvarying.

It is furthermore at times important that the speed of delivery of the sheet feeding means 37 be changed. For example, at times it may be desired to place signatures only between alternate sets of fingers 36 on the conveyor. At other times it is desired that each set of fingers shall carry a set of signatures. In order to accomplish this the drive shaft 38 of the feeding apparatus can be driven at either of two speeds by the shaft 39. To this end the shaft 39 has two sprocket wheels 48 and 49 secured thereto, and passing around these sprocket wheels are chains 50 and 51 that operate on sprocket wheels 52 and 53 rotatable on the drive shaft 38. The end of the drive shaft 38, as shown in Figure 2, has a longitudinal bore 54, and is also longitudinally slotted, as shown at 55. A plunger 56, extending into the end of the shaft 38 and slidably engaged in said bore 54, has an outwardly spring-pressed key 57 pivoted thereto and operating in the slot 55. The two sprocket wheels 52 and 53 are mounted on hubs 58 and 59 provided with key-

ways 60 and 61. By sliding the plunger 56 toward and from the inner end of the bore 54, it will be evident that either sprocket wheel 52 or 53 can be keyed to the shaft 38 and constitute the driving means for said shaft. As the sizes of the sprocket wheels are different, the shaft 38 can thus be driven at different speeds. It will, however, be evident that whichever sprocket wheel 52 or 53 is coupled to the shaft 38, said shaft will nevertheless always operate in a predetermined timed relation with the other mechanisms.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim, is:

1. In combination with sheet connecting mechanism, and a conveyor for carrying sheets thereto to be connected, mechanism for feeding sheets to the conveyor, and means driven from the connecting mechanism for driving the conveyor and feeding mechanism in relatively variable predetermined timed relation.

2. In combination with sheet connecting mechanism, and a conveyor for carrying sheets thereto to be connected, mechanism for feeding sheets to the conveyor, means for driving the sheet connecting mechanism, conveyor and feeding mechanism in predetermined timed relation, and means for varying the period of operation of the feeding mechanism with respect to the sheet connecting mechanism.

3. In combination with binding mechanism, and a conveyor for carrying sheets thereto to be bound, mechanism for feeding sheets to the conveyor, a drive shaft for the binding mechanism and conveyor, a drive shaft for the feeding mechanism, gearing connecting the drive shafts to cause their movement in predetermined timed relation, and means by which the position of the gearing may be altered with respect to one of the shafts to vary the respective periods of operation of the binding mechanism and feeding mechanism.

4. In combination with a support, of a conveyor that travels across the support, mechanism

for carrying sheets transversely of the conveyor and depositing said sheets in substantially flat condition on the support in position to be carried away by the conveyor, and means for folding the sheets on the conveyor as they are carried thereby from the support.

5. In combination with a transversely slotted table, of a conveyor that operates on said slotted portion of the table and has upstanding sheet-engaging fingers projecting through the slot, mechanism at one side of the table and operating transversely to the slot and conveyor for carrying sheets in substantially flat condition, successively to and depositing them on the table across the slot and in position to be engaged by the fingers and carried from the table, and grooved rollers operating over the conveyor and folding the sides of the sheets into angular relation.

6. In combination with stapling mechanism and a conveyor for delivering assembled sheets thereto, of mechanism for feeding sheets to the conveyor, and driving mechanism for operating the stapling mechanism, the conveyor and the feeding mechanism in predetermined timed relation, including means for altering the speed of operation of the feeding mechanism with respect to both the conveyor and stapling mechanism.

7. In combination with stapling mechanism and a conveyor for delivering assembled sheets thereto, of mechanism for feeding sheets to the conveyor, and driving mechanism for operating the stapling mechanism, the conveyor and the feeding mechanism in predetermined timed relation, including means interposed between the stapling mechanism and feeding mechanism for altering the speed of operation of the feeding mechanism with respect to the conveyor, and an additional means by which the timed relation of the feeding mechanism can be changed with respect to the conveyor.

8. In combination with a feeding mechanism and a conveyor for carrying sheets therefrom, of driving mechanism between the conveyor and the feeding mechanism, including change speed gearing for varying the relative speed of the conveyor and feeding mechanism, and means additionally for varying the timed relation of operation of the feeding mechanism with respect to the conveyor.

ALBERT BROADMEYER.