

No. 651,307.

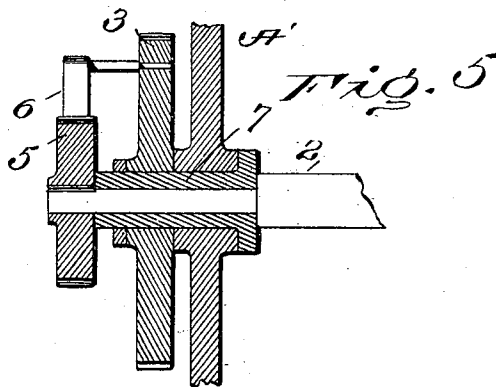
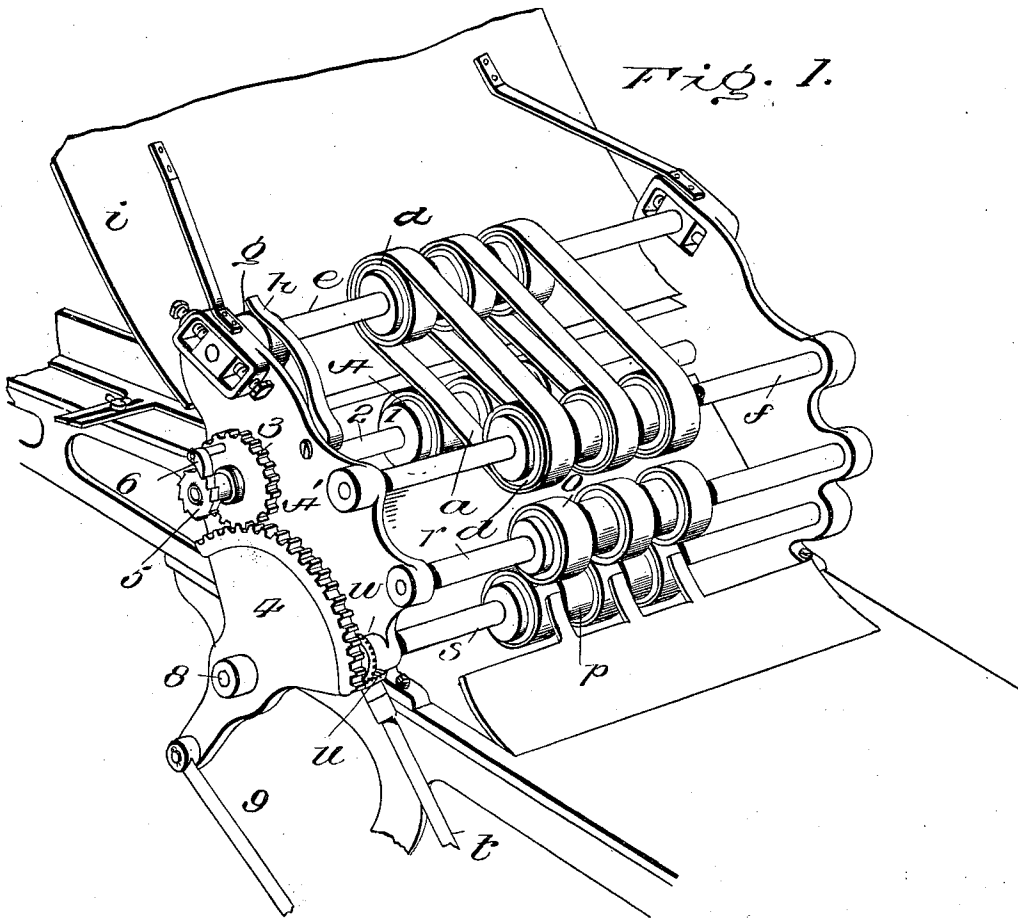
Patented June 5, 1900.

C. G. HARRIS.  
SHEET FEED OR SEPARATOR.

(Application filed Dec. 26, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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Inventor

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(No Model.)

3 Sheets—Sheet 2.

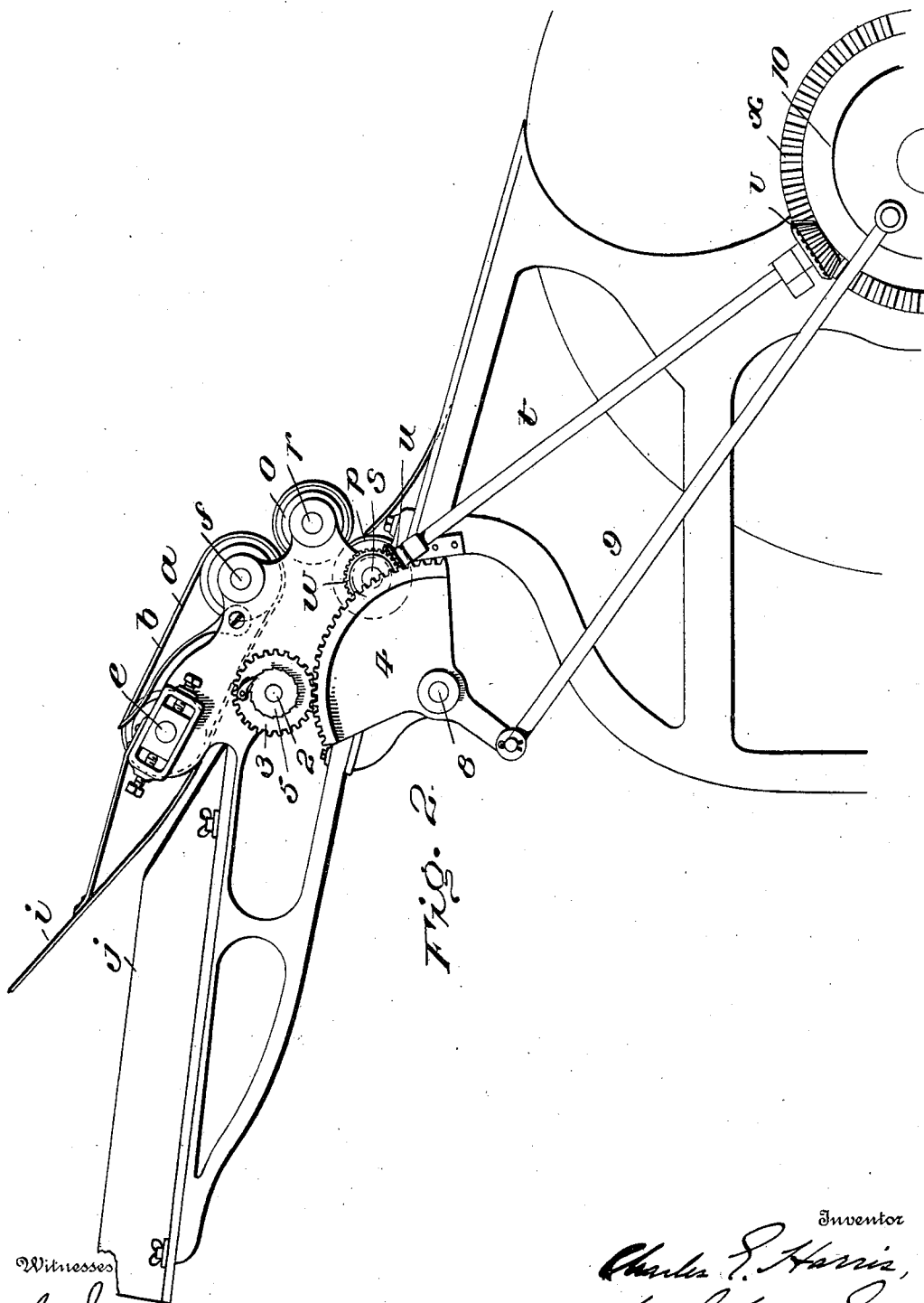


FIG. 2.

Witnesses

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No. 651,307.

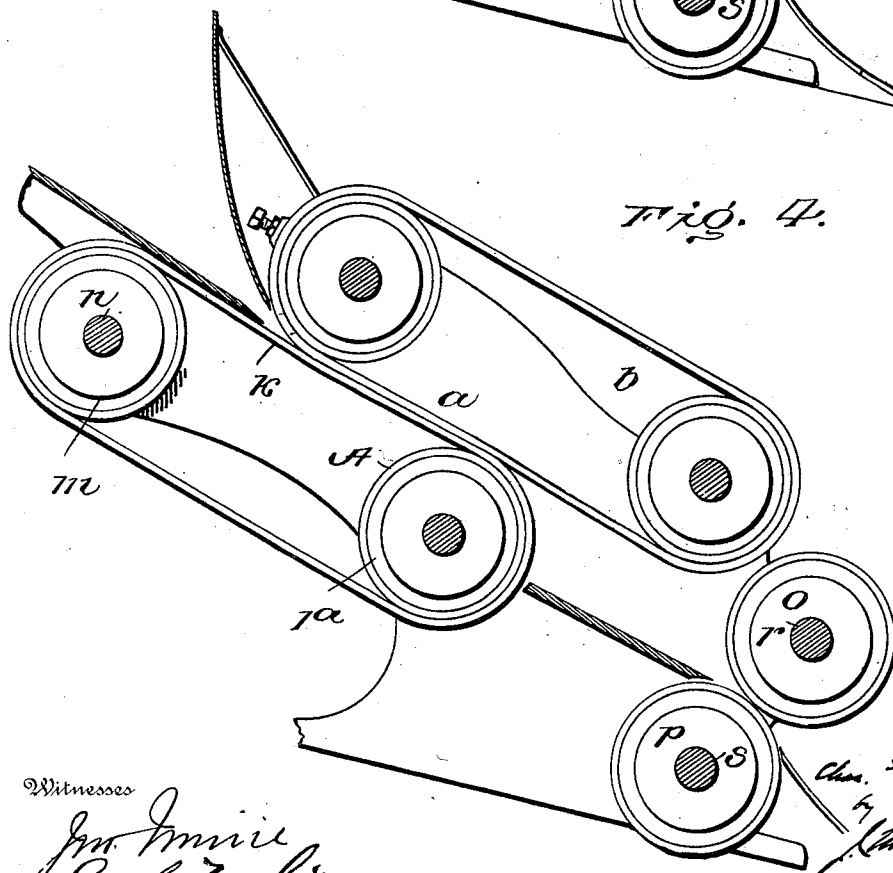
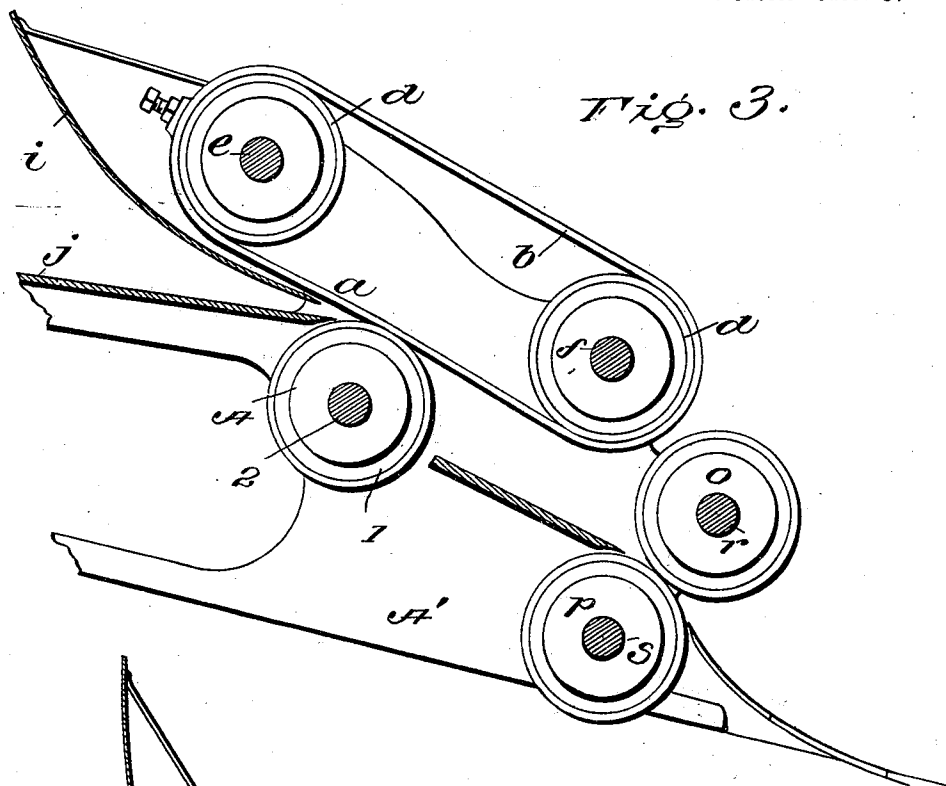
Patented June 5, 1900.

C. G. HARRIS.  
SHEET FEED OR SEPARATOR.

(Application filed Dec. 28, 1899.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

CHARLES GRANT HARRIS, OF NILES, OHIO, ASSIGNOR TO THE HARRIS  
AUTOMATIC PRESS COMPANY, OF SAME PLACE.

## SHEET FEED OR SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 651,307, dated June 5, 1900.

Application filed December 26, 1899. Serial No. 741,650. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES GRANT HARRIS, of Niles, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Sheet Feeds or Separators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to means for separating sheets of paper of any thickness, whereby they may be severally fed from a pile or stack to a printing-press or other machine.

The primary object of the invention is to insure the separation of the sheets, so that in the feeding thereof they will maintain the same relative order in which they were stacked; and a further object is to prevent the feeding of more than one sheet at a time.

The invention is characterized in that one of two coacting elements, itself positively driven, will drive the other or complementary contact element only when they are in direct engagement or there is but a single sheet interposed. The last-mentioned contact being frictionally retarded will not be acted upon by the positively-operated contact when a plurality of sheets is between the two contacts, in which event the said positively-operated contact will act on the several sheets in their relative order.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective showing an embodiment of my invention. Fig. 2 is a side elevation with operating-gearing. Fig. 3 is an enlarged view of the two coacting contacts and feed-rolls. Fig. 4 is a similar view showing a slight modification in one of the two contacts. Fig. 5 is a sectional detail.

The carrying out of my invention is not restricted to any special construction. The essential requisites are two contacts, of which one is positively operated, while the other will travel with it only when they are in direct engagement or there is but a single sheet interposed. When a plurality of sheets is

present, this second contact, which is under frictional retardation, is practically immovable. The feeding of the sheets may be from the top or bottom of a pile or stack of paper, and the latter may be presented at any slant or inclination.

In the drawings, A designates the positively-driven contacts, and *a* the complementary coacting contacts. The former comprise rolls 1, preferably of rubber, fast on a shaft 2, journaled in frame A'. This shaft is intermittently positively operated by any suitable mechanism. That shown embodies a gear-wheel 3, a racked segment 4, a ratchet-wheel 5, and pawl 6. The wheel 3 is on a sleeve 7, loose on shaft 2, while ratchet-wheel 5 is fast on said shaft, and the pawl being carried by wheel 3 the shaft 2 will be rotated only in one direction. The racked segment 4 is fulcrumed at 8 and is reciprocated by a pitman 9, connected to a crank-pin of a wheel 10 of the press or machine to which the stock is to be fed.

The coacting contacts *a* are shown as composed of endless flexible belts *b*, engaging two sets of rolls *d*, mounted on shafts *e* and *f*, journaled in frame A', one shaft having adjustable bearings to regulate the tension of the belts. Upon shaft *e* is a roll *g*, against which bears a friction-plate *h*, performing the office of a brake, the frictional engagement serving to retard or prevent the coaction of the belts with the rolls 1 save when they are in direct engagement or there is but a single sheet interposed. The rolls 1 engage the belts *b* at about the center of the latter—that is, midway between the two sets of rolls *d*. As before stated, when the engagement between rolls 1 and belts *b* is direct or there is but a single sheet interposed the belts will rotate with the rolls; but if there be more than one sheet present the retardation placed upon the belts of the coacting contacts by the friction-plate *h* not being overcome by the positively-driven contacts only the latter—that is, the rolls 1—are rotated.

In the drawings the coacting contacts are shown relatively arranged for feeding from the bottom of a pile of sheets introduced between the guides *i* and *j* of a hopper. To feed from the top, it is only necessary to in-

vert the two coacting contacts, placing the rolls 1 above the belts *b*. It matters not how the sheets are presented. If a plurality of them be inserted between the two coacting elements and even if their forward edges be so arranged that the edge of the sheet which should be first fed is in rear of those which should follow, the latter will not be fed fully forward in advance of their relative order as their progress is arrested, since the retarded coacting element cannot feed forward the sheets without the aid of the positively-driven contact. The sheet which should be fed forward first being in engagement with the latter contact element, but out of engagement with the retarded coacting element, will be fed forward in advance of the other interposed sheets, and this will be repeated with each sheet until there is but a single sheet interposed, when the retarded coacting element will be free to rotate with the positively-driven element. When there is more than one sheet interposed, the sheet acted upon by the latter element will in its travel slide against the retarded sheet or sheets.

It is not essential that the coacting contact elements be made up of the parts shown. In Fig. 4 I have shown the positively-driven contact element as the counterpart of the frictionally-retarded coacting element—that is, belts, as *k*, may be placed in engagement with rolls, as *l*<sup>a</sup>, and complementary rolls, as *m*, on a shaft *n*, the belts *k* having a more extended engagement with belts *b* than when the rolls 1 are in direct engagement with the latter. This modification is shown in support of the statement that the invention is not confined to any special parts.

Any suitable feed-rolls may be arranged in juxtaposition to the coacting elements of the separator for engaging and feeding a sheet after the rolls 1 cease to be positively driven. I have shown two sets of rolls *o* and *p*, mounted, respectively, on shafts *r* and *s*, journaled in frame *A'*, the shaft *s* being positively rotated by a shaft *t*, having on its ends beveled gear-wheels *u* and *v*, the former meshing with a similar wheel *w* on shaft *s* and the wheel *v* with beveled teeth *x* of wheel 10. A sheet of paper taken up by these feed-rolls will cause the continued rotation of the positively-driven rolls 1 even after their driving means cease to act thereon. As each sheet is fed by the rolls *o* and *p* it may pass directly into a press or other machine or onto a conveyer, by which it may be conveyed to the desired point.

The advantages of my invention are apparent. The secret of its success lies in the fact that while the two coacting elements will revolve in unison when in direct engagement and also when but a single sheet is interposed, yet when there is a plurality of sheets present the complementary coacting element is retarded and only the sheet with which the positively-driven contact is in di-

rect engagement will be separated from the others.

I claim as my invention—

1. A sheet feed or separator having two coacting contacts, one being positively driven and the other frictionally retarded but driven by the former only when they are in direct engagement or with a single sheet interposed, the positively-driven contact feeding only the sheet with which it is in engagement when a plurality of sheets is interposed between the contacts.

2. A sheet feed or separator having two coacting contacts, one being intermittently positively driven and the other frictionally retarded but driven by the former only when they are in direct engagement or with a single sheet interposed, and means for feeding a sheet after the driving means of the first-mentioned contact ceases to operate the latter, as set forth.

3. A sheet feed or separator having two coacting contacts, one being intermittently positively driven and the other frictionally retarded but driven by the former only when they are in direct engagement or with a single sheet interposed, the positively-driven contact feeding only the sheet with which it is in engagement when a plurality of sheets is interposed between the two contacts, and feed-rolls for acting on the sheet when the positively-driven means cease to act on the first-mentioned contact, thereby moving the latter independent of its driving means.

4. A sheet feed or separator having a positively-driven contact element, and a coacting flexible contact element frictionally retarded but driven by the former contact only when they are in direct engagement or with a single sheet interposed, as set forth.

5. A sheet feed or separator having a positively-driven contact element, and a coacting contact element, the latter comprising endless belts which are designed to engage and be driven by the positively-driven contact element, and means for retarding the movement of said belts when a plurality of sheets is interposed between them and the positively-driven contact element, as set forth.

6. A sheet feed or separator having a contact element, comprising a shaft, rolls thereon, and means for intermittently positively rotating said shaft, and a complementary coacting contact element frictionally retarded but driven by the other contact element only when in direct engagement or with a single sheet interposed, as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES GRANT HARRIS.

Witnesses:

C. G. PRITCHARD,  
W. H. SMILEY.