March 1, 1932. W. P. ZENT 1,847,741

SHEET STACKING AND STRIPPING FOR PRINTING PRESSES

Filed July 24, 1929 3 Sheets-Sheet 1

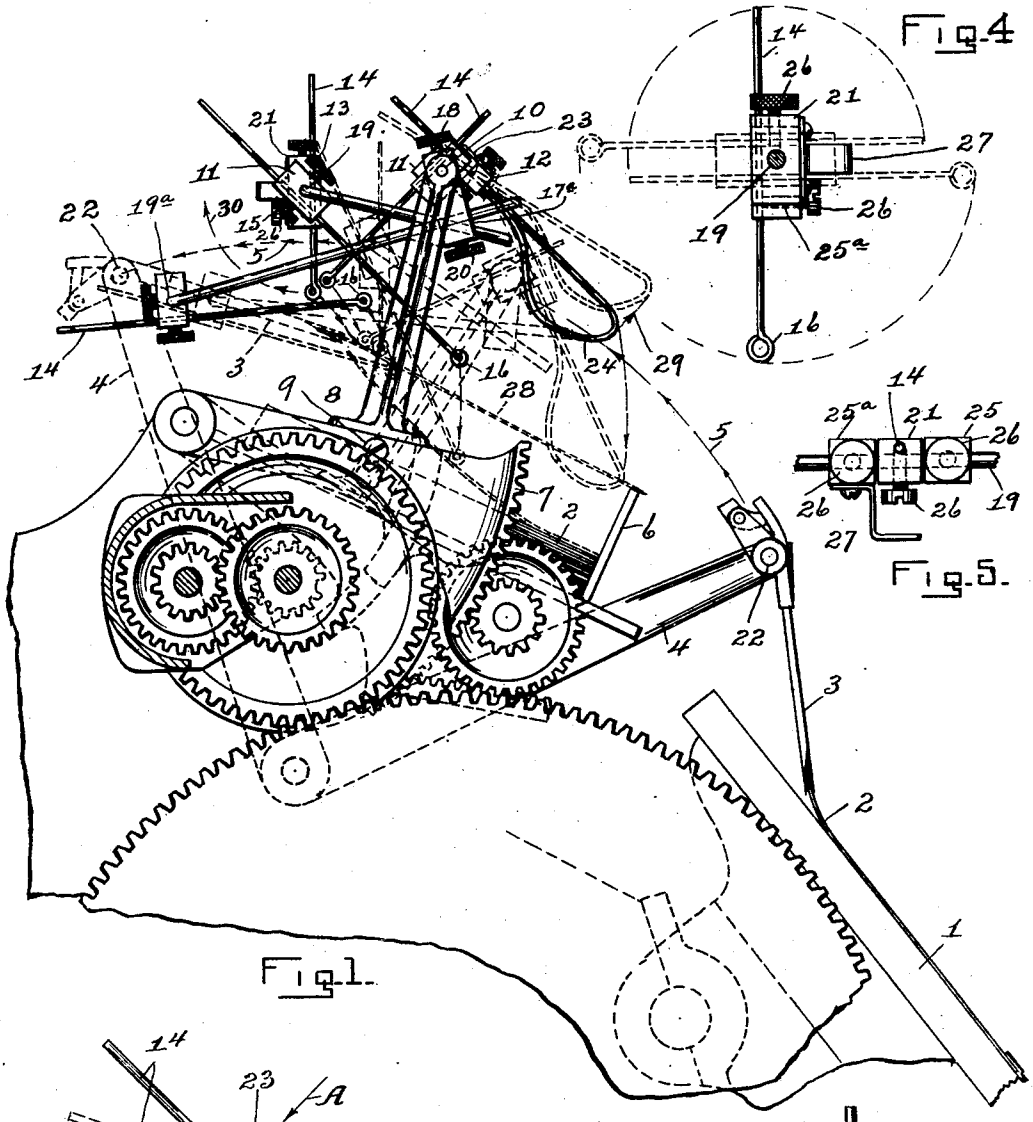


Fig. 1.

Fig. 4.

Fig. 5.

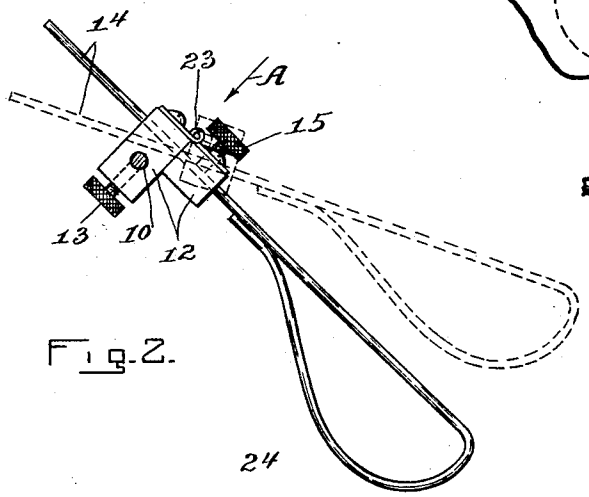


Fig. 2.

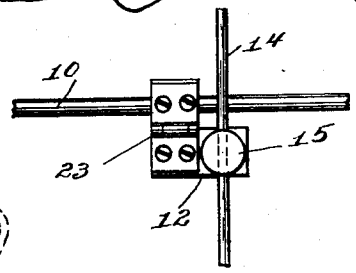


Fig. 3.

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SHEET STACKING AND STRIPPING FOR PRINTING PRESSES

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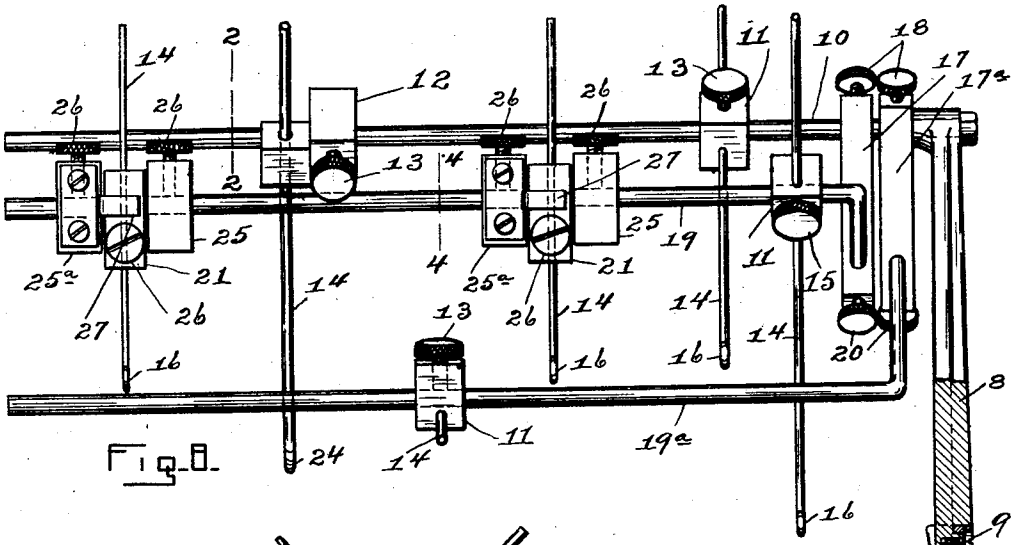


Fig. 8.

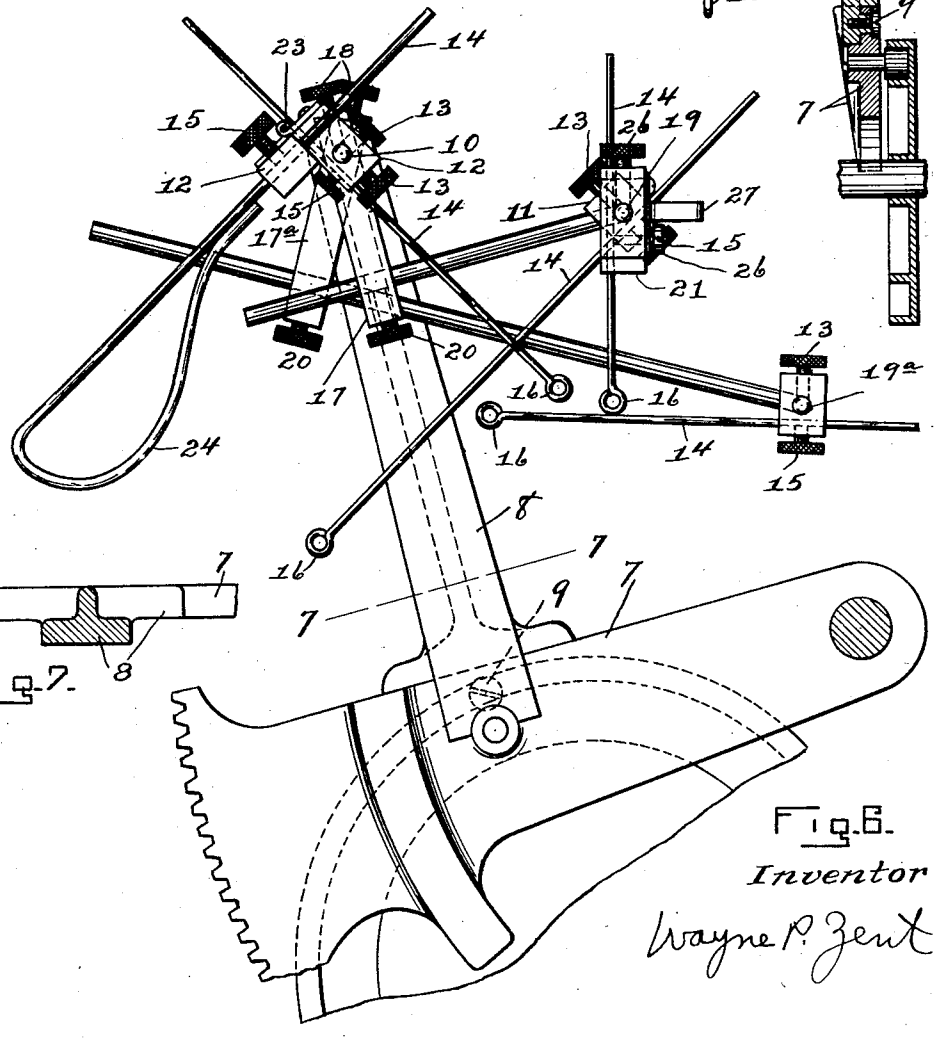


Fig. 6.

Fig. 7.

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SHEET STACKING AND STRIPPING FOR PRINTING PRESSES

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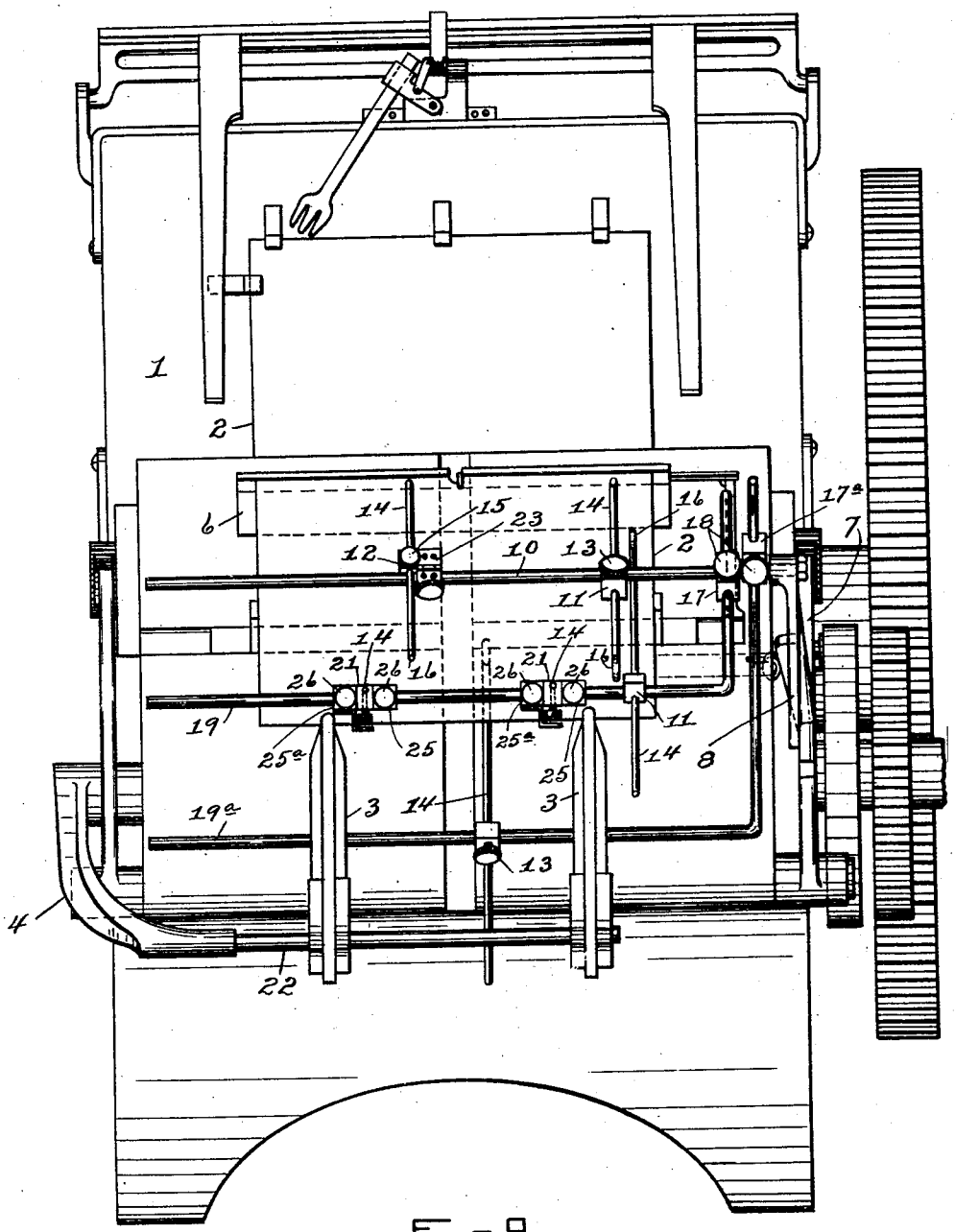


Fig. 9.

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UNITED STATES PATENT OFFICE

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SHEET STACKING AND STRIPPING FOR PRINTING PRESSES

Application filed July 24, 1929. Serial No. 380,693.

This invention embodies an apparatus for engaging with sheets of paper, or other objects as printed, at a time and place of delivery by the delivery fingers or tapes of the printing press, and then depressing them toward and into a suitable receptacle.

An apparatus made in accordance with the present invention includes means for stripping the printed sheet from the delivery apparatus, thereafter guiding it into and retaining it within a receiving receptacle, the term sheet in this specification is intended to include any object that has ordinarily been used for printing.

Moreover, the apparatus is preferably of such character and construction that it is capable of ready attachment to various automatically fed presses, the specification, however, being confined to an automatically fed platen printing press.

A further object of this invention is to provide means of adjustment and adaptation to the various sheet sizes as required in the art of printing and as well on various sizes and styles of printing presses.

A further object is to provide means to facilitate the proper functioning of the delivery fingers in the engagement with the printed sheet as well as its final delivery of the same, thereby adding to the scope or range of the delivery fingers as positioned for continuous operation without further interruption due to irregular cut or curled sheets.

Referring to the drawings, Fig. 1 is a view in side elevation partly broken away, of a printing press showing this invention attached to the rocker arm of press automatic feeder. Fig. 2 is an enlarged vertical sectional view taken on the line 2—2 of Fig. 8 showing hinged sheet engager device. Fig. 3 is a view of the same looking in direction of the arrow A. Fig. 4 is a vertical section taken on the line 4—4 of Fig. 8 showing the swivel sheet engager device. Fig. 5 is a top plan view of the same. Fig. 6 is an enlarged view similar to Fig. 1 showing the method of attaching this invention to the rocker arm of a printing press automatic feeder. Fig. 7 is a section taken on the line 7—7 of Fig. 6. Fig. 8 is a view in front elevation of this invention attached to a rocker arm of a printing press automatic feeder. Fig. 9 is a top plan view of this invention.

Similar characters of reference designate corresponding parts in all the figures.

Proceeding now to a detailed description of the various features of this invention as illustrated in an embodiment thereof applied to a Gordon printing press, 1 designates the press platen, 2 a printed sheet thereon, 3 an ordinary delivery finger with its operating arm 4 which has a travel arc as indicated by the arrows 5 for the delivery of the printed sheet 2 into the receptacle 6.

In Fig. 1 is shown a view of the gear assembly of an automatic press feeder of the Gordon press type including a rocker arm 7 to which is attached the main standard 8 of this invention by a lug screw 9.

The upper portion of the standard 8 bears a main cross member 10 which carries a fixed sheet engager device 11 and a hinged sheet engager device 12, the sheet engager devices having lateral and circular adjustment upon the cross members 10 and 19 by means of the thumb screws 13 and flexible sheet engager fingers 14 having longitudinal adjustment means by the thumb screw 15.

The fixed sheet engager 11 is so termed to designate that it can only be applied at a fixed position or set position on the cross members 10, 19 or 19*a*, in the clear of the travel of the delivery carriage 22. It primarily functions to retain the printed sheet in the receptacle 6 after being released from the delivery finger 3 and secondarily to under strike the printed sheet at delivery finger releasing point when it is mounted on the cross member 19*a* and when so used it also is in the clear of the delivery carriage travel area. The function performed by fixed sheet engager 11 is to strike the printed sheet with engager fingers 14 at points within the area of the travel of the delivery carriage 22 which carriage is the mounting for the delivery fingers 3, and at a depth below the arc line of its travel to and from the platen 1 to allow the delivery fingers 3 to grasp a printed sheet and deliver it to the receptacle 6.

Sheet engager fingers 14 bear rounded ends

16 for protective means against slurring the printed sheets 2. Sheet engager fingers 14*a* are provided with the cam shaped ends 24 to increase the flexibility of the finger. The sheet engager fingers as used with either the fixed, swiveled or hinged sheet engager device are mounted in a similar manner and are adjusted and set by like means, the proper functioning of the engagers being obtained by the means provided and described in each case.

The functions of the hinged sheet engager 12 and the swivel sheet engager 21 are alike, the different number designations being used in view of a slight difference in construction as shown in Fig. 8. These sheet engagers function by having their engager finger 14 set to strike the sheet at time of release by the delivery fingers 3 and force it forward and downward into the receptacle 6, the yieldable means of their construction making it possible to set the sheet engager finger 14 the required depth to obtain this result and to be swiveled or hinged upward by contact of the delivery finger carriage 22 in its travel to and from the platen 1 without damage to the finger 14 which would occur if the fixed sheet engager was used for this purpose. When my device is in action the delivery mechanism as represented in the delivery carriage 22 and its delivery fingers 3 is at rest during this interval and does not become in motion until my device is at rest so there can be no interference of the carriage 22 or the delivery fingers 3 with any part of my device except the engagers as above shown, the other parts of my structure being fully in the clear of the carriage and its delivery fingers when they are in motion.

Offset arms 17 and 17*a* have lateral and circular adjustment on the main cross member 10 by the thumb screw 18 and carry offset cross members 19 and 19*a* which have lateral and circular adjustment by means of the thumb screw 20. The cross members 19 and 19*a* carry fixed sheet engager devices 11 and the cross member 19 carries swivel sheet engager devices 21.

In Figs. 2 and 3 is shown a hinged sheet engager device 12 which is designed for use on either of the cross members 10 and 19 when positioned thereon at a point in line with the travel arc of the delivery finger carriage 22, the hinge or spring member 23 allowing an upward deflection of the cam shaped end 24 of the sheet engager finger 14 when it contacts with the carriage 22 in its travel arc.

In Figs. 4 and 5 is shown a swivel sheet engager device 21 which is designed for use on the cross members 10 and 19 when positioned thereon at a point in line with the travel arc of the delivery finger carriage 22, the swivel sheet engager device 21 being positioned on the cross members 10 and 19 by the guides 25 and 25*a* which have lateral and circular adjustment thereon by the thumb screw 26, the guide 25*a* having a detent arm 27 to determine the throw of the finger 14 as shown in Fig. 4.

The general operation of the foregoing sheet stripping and stacking device for printing presses may be briefly described as follows:

Taking as normal position the position of the mechanism as shown at rest above the receptacle 6 the fingers 3 are closed as the carriage travels toward the platen 1 and are set to determine the extent of their travel into the platen area. As they near this set position the fingers are automatically opened and the lower section of the finger passes under the sheet and the upper section passes over the sheet. The fingers are then automatically closed upon the sheet and it is carried to the point of the assumed normal position of the delivery mechanism when the sheet is now directly above the receptacle 6 and the delivery fingers 3 are again automatically opened to release the sheet for delivery into the receptacle 6.

Assuming the delivery fingers 3 have grasped a printed sheet 2 from the platen 1 and carried it along the arc as indicated by the arrows 5 by the movement of the delivery carriage 22, it will rest approximately on the dotted line 28 above the sheet receptacle 6 when the delivery finger operating arm 4 has reached the set extent of its rearward travel as represented in the dotted line showing in Fig. 1. Ordinarily at this interval the delivery fingers 3 release the printed sheet 2 and it drops by its own weight into the sheet receptacle 6 to be jogged by a downward movement of the rocker arm 7 acting on the jogging device. Unless the sheet 2 is completely released from the delivery fingers 3 which release failure may be due to static adherence to fingers, upward curling of the sheet above the maximum bite as closely defined in setting of the fingers to grasp the sheet from the platen, or any other defect existent in ordinary sheet delivery devices, the sheet will not leave the fingers and be returned to the platen to interrupt the continuous action of the press and automatic feeder operations and cause delay and spoilage of the work under production.

This invention is designed to overcome these faults in the ordinary way of delivery of the printed sheets 2 into the receptacle 6 and to thereby increase production and insure perfect delivery of the printed sheet without loss of time or spoilage.

Returning to the point where the delivery fingers 3 release the printed sheet 2 for delivery into the receptacle 6, the rocker arm 7 is driven downward carrying the device as represented in this invention downward with an angular forward motion and the sheet en-

gager fingers 14 being positioned by the adjustable means as has been clearly shown forces the printed sheet 2 from the delivery fingers 3 into the receptacle 6 to be jogged into a neat pile and preventing upward curling or upward static impulse of the sheets in the receptacle 6, leaving a clear passage of the delivery fingers 3, as the rocker arm 7 returns to its normal position, to return to the platen 1 for delivery of another printed sheet 2 into the receptacle 6.

The delivery fingers of the automatic feeding device, as partially shown sufficient to illustrate the mounting and action of this invention, are restricted to a maximum bite or grasp of the printed sheet 2 by the delivery fingers 3 to allow its proper release at point of delivery. The restriction is indicated as $\frac{1}{16}$ inch to allow sufficient time for the sheet 2 to leave the delivery fingers 3 during their opening at releasing position above the receptacle 6. This very brief interval when the fingers 3 are open to release the sheet for delivery to the receptacle 6 is termed in my specification as the delivery dwell and the sheets must free themselves from the opened fingers 3 by dropping of their own weight or they will be again grasped by the fingers and returned to the platen 1 causing the troubles and damage as enumerated in the above specification. Under ordinary use when a sheet does not free itself from the fingers the speed of the press must be reduced sufficiently to permit a dwell at releasing point of the fingers so the sheet can free itself. My device frees the sheet from the fingers 3 by forcing it from the fingers instantly and thereby permits the press to be run at full speed no matter what condition of the sheet or delivery contingency may arise, such as a decrease in an assumed size of the sheet by curled warpage or uneven cutting, which heretofore has been the cause of spoilage of the work, displacement of the register stops and considerable delay and damage to the product due to sheet 2 remaining on the platen 1 and becoming clogged in the sheet feeding mechanism.

The use and intent of this invention is to overcome this fault by and with the means as already described, as a sufficient bite or grasp can be taken on the printed sheet 2 by the delivery fingers 3 to meet the variation, not possible by the present maximum extent, to handle the variation in size of sheet as described and free it from the delivery fingers 3 for delivery into a neat pile in the receptacle 6.

The sheet engager fingers 14 when used on the main cross member 10 or the offset cross member 19 engage with the top or printed side of the printed sheet 2 and when mounted on the offset cross member 19*a* engage with the under side of the printed sheet, the action of members 19*a* and 14 being to push the sheet upward from the delivery fingers 3. The offset cross member 19*a* is adjusted to clear beneath the delivery finger carriage 22.

The arrows 29 indicate the upward travel of the hinged sheet engager device 12 when its cam shaped end 24 is contacted by the travel of the delivery finger carriage 22. In Fig. 4 is shown a like action for the swivel sheet engager device 21, and is also partly illustrated by the arrows 30. The other arrows as shown in Fig. 1 indicate approximate travel of the sheet engager fingers to engage with the printed sheet 2.

It has been shown that the sheet engager devices are interchangeable for use on the several cross members 10 and 19 and that intent is shown to strike any point on the surface of the printed sheet 2 with the sheet engager fingers 14 to secure a perfect delivery of the sheet 2 from the delivery fingers 3 into the sheet receptacle 6.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is—

1. In a sheet stripping and stacking apparatus for a printing press, the combination of delivery finger mechanism for delivering the sheet, a downward and forward drive mechanism, and sheet engager fingers actuated by the aforesaid drive mechanism for engaging and depressing a sheet into a receptacle.

2. The combination with the sheet delivery fingers of a printing press, and means for engaging and depressing a sheet during the dwell or pause at the end of its delivery cycle.

3. The combination of sheet delivery fingers, a sheet stacker and stripper for releasing a sheet therefrom, and further means to force it into a receptacle.

4. The combination of a sheet stripper and stacker, adjustable fingers to engage the sheet, and driving means to depress and forward the sheet from its delivery mechanism and against return thereto.

5. The combination of a sheet stripper and stacker with sheet engaging mechanism with means to provide clearance at delivery end of travel of sheet delivery mechanism.

6. The combination of a sheet stripper and stacker with sheet engager fingers having means of lateral, radial and longitudinal adjustment for sheet engagement.

7. The combination of a sheet stripper and stacker with sheet engager supporter members having means of lateral, longitudinal and radial adjustment over a certain sheet receptacle area.

8. In a sheet stripping and stacking apparatus for a printing press, the combination of downward drive mechanism, three way adjustable depressing members having longitudinal, adjustment and with means of clearing other moving mechanism.

9. The combination of a sheet stripper and

stacker, a printing press, a delivery mechanism, sheet engager fingers to contact the top or printed side of a sheet, and means to position the fingers to strike the sheet at any point of its surface area and at any desired degree of depression.

10. The combination of a sheet stripper and stacker, a sheet engager finger to contact the under side or bottom of a printed sheet at time of its delivery cycle, a receptacle into which the sheets may be delivered, and means to position the finger to strike the sheet at a choice of plural positions along its under or bottom side and at any degree of contact pressure.

11. The combination of flexible fingers, cross members on which said fingers are adjustably mounted, a rocker arm on which the cross members are mounted whereby to contact the fingers with a printed sheet to strip it from a delivery mechanism and depress it into a receptacle.

12. The combination of a printing press, a printed sheet delivery mechanism, a rocker, a receptacle, a sheet stripper and stacker mechanism, and means to synchronize the action of the combination to contact the sheet engager fingers with the printed sheet at its delivery point.

13. In a sheet stripping and stacking mechanism a printed sheet delivery mechanism, sheet engager fingers, and means of contacting said sheet engager fingers against a printed sheet at a point previous to its automatic release from a delivery finger.

14. In a sheet stripping and stacking mechanism a printed sheet delivery mechanism, sheet engager fingers, and means of contacting said sheet engager fingers against a printed sheet at a point synchronized with the instant of release of the printed sheet from a delivery finger.

15. In a sheet stripping and stacking mechanism a printed sheet delivery mechanism, sheet engager fingers, and means of contacting said sheet engager fingers against a printed sheet at a point subsequent the self dropping of the sheet from a delivery finger.

16. The combination of sheet delivery fingers and means to add weight to a printed sheet to strip it from its delivery fingers and augment its travel into a receptacle.

17. The combination of sheet delivery fingers, and means to strike a printed sheet to strip it from the delivery fingers and force its travel into a receptacle.

18. The combination in a printing press of sheet delivery fingers, an automatic sheet striking device, and means for adjusting same to permit a greater bite or grasp on the printed sheet to be delivered by the delivery fingers.

19. The combination in a printing press of sheet delivery fingers, an automatic sheet striking device, a sheet receiving receptacle, and means to retain the printed sheet within a sheet receiving receptacle during delivery thereinto when released by the sheet delivery fingers.

20. The combination in a printing press of an automatic sheet stripper and stacker, a sheet delivery receptacle, sheet delivery fingers, and means to retain the printed sheet within the sheet delivery receptacle after delivery thereinto when released by the sheet delivery fingers.

21. In a sheet stripping and stacking apparatus for a printing press, the combination of downward drive mechanism, and three-way adjustable depressing members having longitudinal adjustment.

In testimony whereof I affix my signature.

WAYNE P. ZENT.