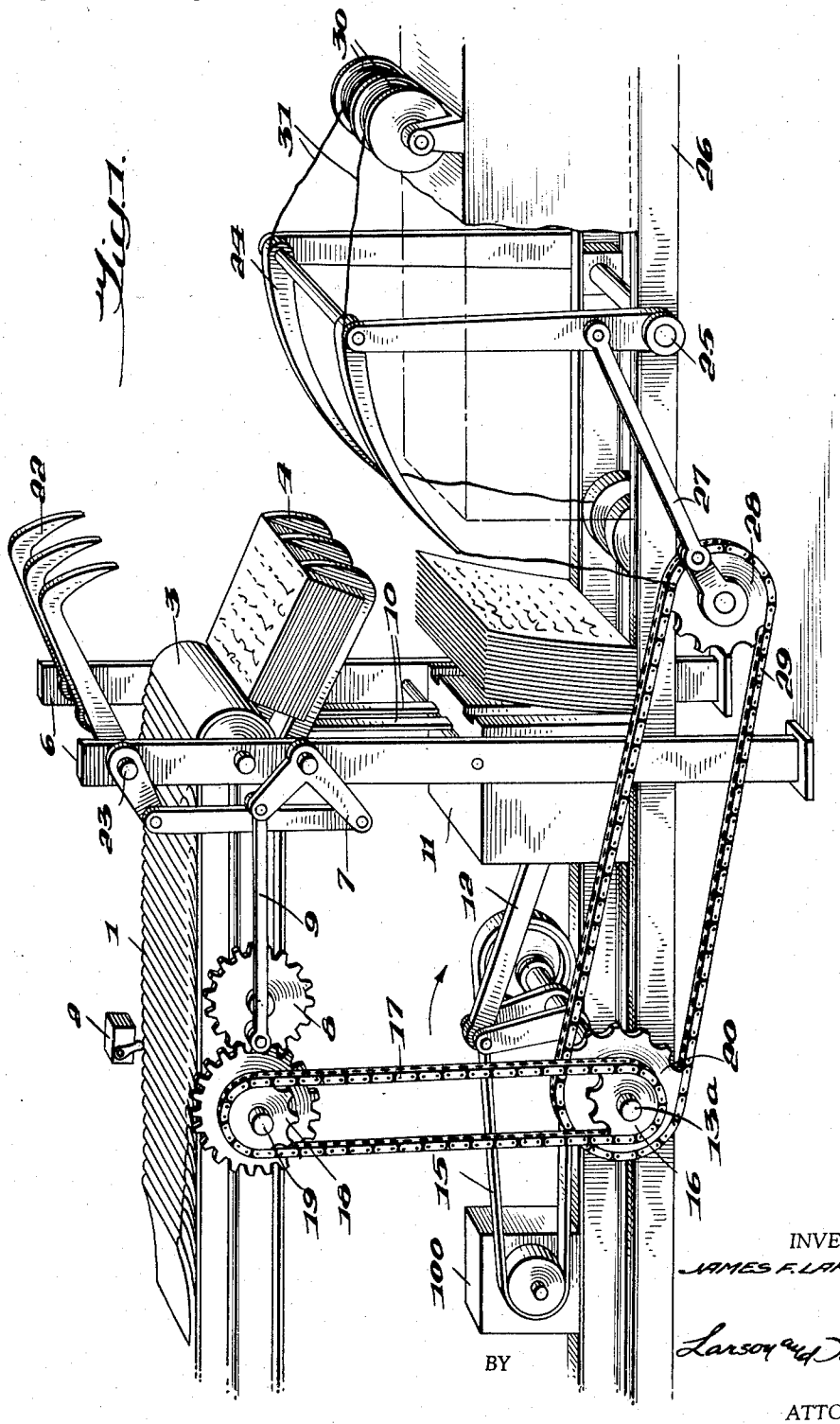
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COUNTING AND PACKAGING MACHINE

Original Filed April 11, 1952 3 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

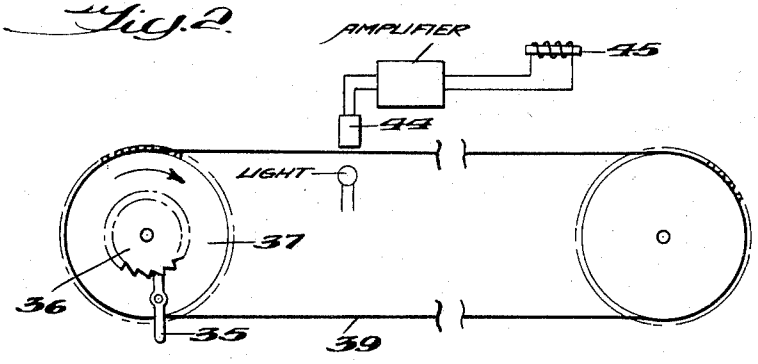



Fig. 3.

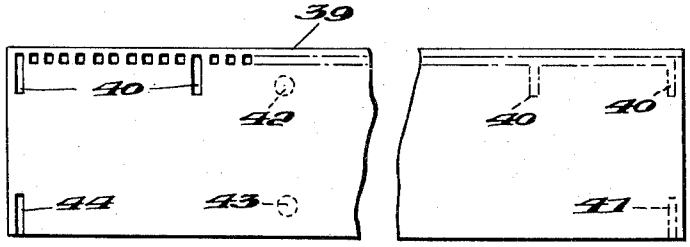
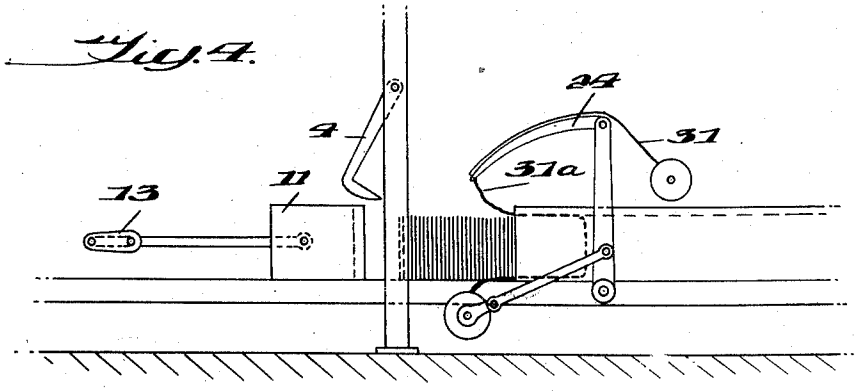



Fig. 4.




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Fig. 5.

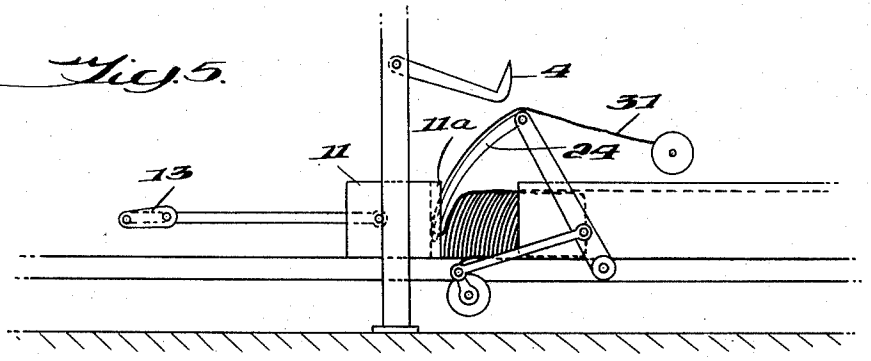



Fig. 6.

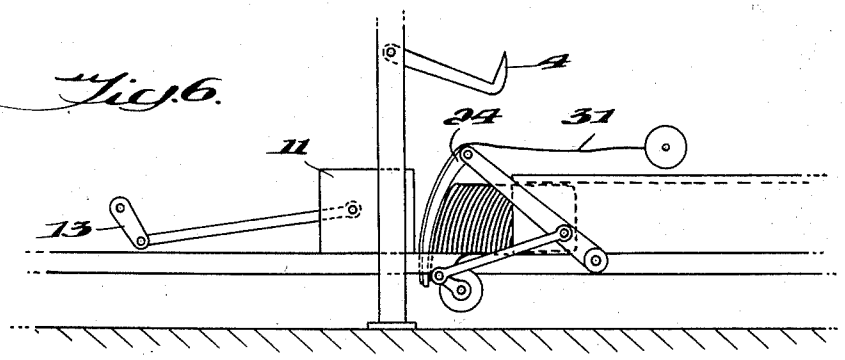
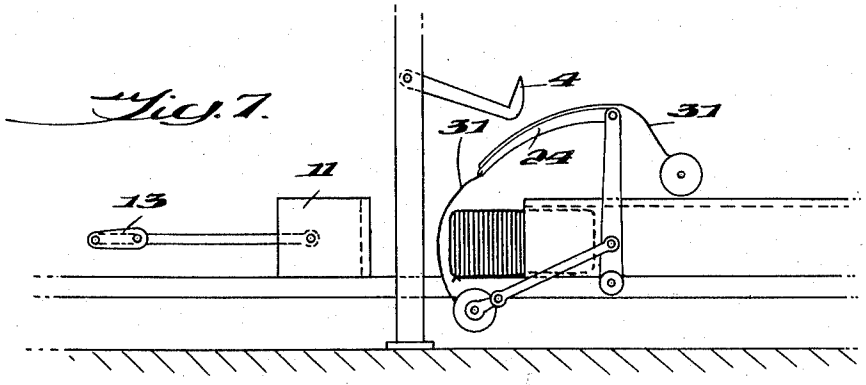



Fig. 7.




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United States Patent Office 2,842,035 Patented July 8, 1958



2,842,035

# COUNTING AND PACKAGING MACHINE

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Original application April 11, 1952, Serial No. 281,821, now Patent No. 2,695,087, dated November 23, 1954. Divided and this application August 13, 1954, Serial No. 450,346

1 Claim. (Cl. 93—93)

The present invention relates to a packaging machine and more particularly to an apparatus which may be used for counting and packaging newspapers and the like.

Heretofore there has not been provided any suitable means for counting and packaging newspapers as they are delivered from the press. Generally speaking a number of counters are stationed at the end of the press and these persons count the papers as they are delivered from the conveyor and when a suitable number is reached stack the papers and remove them. This is a highly insufficient system and results in a considerable waste of manpower.

The present invention provides a means which automatically counts the papers after they are delivered from the press and stacks the newspapers in a bundle and provides means for tying the bundle. This is accomplished through the combination of a photoelectric counting device with a suitable mechanical linkage for moving the piled newspapers. In the mechanical actuating mechanism there is provided a number of fractional revolution clutches and these clutches are described more specifically in my Patent No. 2,695,087 issued November 23, 1954. The present application is a division of the application resulting in the above-identified patent.

Referring to the drawings,

Fig. 1 is a perspective view of my packaging machine;

Fig. 2 is a diagrammatic elevational view of the control mechanism for the machine of Fig. 1;

Fig. 3 is a diagrammatic plan view of the control mechanism of Fig. 2;

Figs. 4, 5, 6, and 7 are diagrammatic views of the machine of Fig. 1 showing the sequence of operation thereof.

According to the present practice, the newspapers come rapidly off the printing presses and a large number of men are employed to count the newspapers and to tie them in appropriate bundles. These are the bundles which are distributed to the local paper boys.

Referring to Fig. 1, the newspapers as they come off the press are generally indicated by reference numeral **1**. A counter **2** (whose operation is to be described later with reference to Fig. 2) counts the newspapers as they leave the press. As the newspapers come off a belt **3**, they are caught by a supporting member **4**. Supporting member **4** is pivotally mounted at **5** to posts **6**. Belt crank lever **7**, connected to gear **8** through linkage **9**, is fixedly mounted to the supporting member **4**. One revolution of gear wheel **8** will cause the supporting member **4**, through the action of linkage **9** and the belt crank lever **7**, to pivot in a clockwise direction through stripper bars **10**, thus stripping the papers from supporting member **4** and causing them to drop into the packaging cavity below. Upon completion of the revolution of gear wheel **8**, the supporting member **4** will have returned to the position shown in Fig. 1. The counter **2**, as described below, determines when gear wheel **8** is to be actuated to drop the papers into the packaging cavity.

As the papers are dropped into position, ram **11** is constantly compressing the papers into a package. The



ram is actuated through link **12** connected to crank shaft **13** which is driven by a motor **14** through a belt drive **15**. During normal operation, the crank shaft **13** is constantly rotating in the direction of the arrow.

Fixedly mounted to crank shaft **13** is a sprocket **16** which through chain **17** drives sprocket **18**, with a 1 to 1 ratio between sprockets **16** and **18**. Periodically and under control of counter **2**, sprocket **18** drives gear wheel **19** three quarters of a revolution through a fractional revolution clutch. The ratio of the number of teeth on gear wheel **8** to the number of teeth on gear wheel **19** is 3 to 4, so that for every three quarters of a revolution of gear wheel **19**, gear wheel **8** will rotate a full revolution.

During the revolution of gear wheel **8**, when belt crank lever causes support member **4** to rotate clockwise, belt crank lever **7** also actuates linkage **21** which, in turn, causes support member **22** to rotate in a clockwise direction about its axis **23** to hold the oncoming papers until support member **4** is returned to its normal position.

Needles **24**, rotatably mounted at **25** to frame **26**, are connected through linkage **27**, sprocket **28**, and chain **29** to sprocket **20**. The ratio of the number of teeth in sprocket **28** to the number of teeth in sprocket **20** is three to four, so that, for every three fourths of a revolution of sprocket **20**, sprocket **28** will rotate a complete revolution.

Sprocket **16** is connected to sprocket **20** through a fractional revolution clutch according to the present invention.

Spools **30** are mounted to frame **26** and carry twine or wire **31** for tying the bales of newspapers. The twine is fed through needles **24**, the ends of which cooperate with a tying mechanism (which is not shown and which forms no part of the present invention) in the packaging cavity.

The fractional revolution clutches between members **18** and **19** and between members **16** and **20** are controlled by the supplementary control arrangement indicated generally at **2** in Fig. 1 and shown in detail in Figs. 2 and 3. Referring to Fig. 2, a pawl **35** engages a ratchet wheel **36** causing the ratchet wheel to move clockwise one tooth for each paper passing by pawl **35**. Wheel **37** having teeth **38** rotates with ratchet wheel **36** causing tape **39** to move. Tape **39** is provided on one side with slots **40** and on the other side with slots **41**. Beneath the tape are positioned two lamps **42** and **43**. Immediately above the lamps and opposite the tape are two photo-electric cells **44**, only one of which is shown in Fig. 2. The photo-electric cell is connected through an amplifier to a solenoid **45** which actuates control element **45*a***. The control element **45*a*** is connected to each of the two fractional revolution clutches used with the machine.

As one of slots **40** or **41** passes between its respective light and photo-electric cell, the light is permitted to shine through the slot exciting its respective photo-electric cell which, in turn, causes its respective solenoid **45** to actuate a control element **45*a*** in one of the fractional revolution clutches. With the type of machine described herein, there are more slots **40** than there are slots **41**. In the present example, the ratio is 5 to 1. The slots **40** with their respective photo-electric cell and solenoid arrangement are associated with the fractional revolution clutch between members **18** and **19**. Slots **41** with their respective photo-electric cell and solenoid arrangement are associated with the fractional revolution clutch between members **16** and **20**. Thus, in the present example, for every ten papers counted, the clutch between members **18** and **19** will be caused to operate by control element **45*a*** causing a group of ten papers to drop into the packaging receiving cavity. For every 50 papers counted and dropped into the cavity, the clutch between members **16** and **20** will be engaged causing needles **24** to move down to tie the package of 50 papers.

Figs. 4 through 7 show generally the sequence of opera-

tion of the parts at the time of the tying operation. In Fig. 4, supporting member 4 has just dropped the last load of papers into the package receiving cavity. The clutch operating needles 24 have just been engaged and ram 11 is about to compress the papers into the final package.

In Fig. 5, the ram has completed its compressing stroke and the needles 24 have carried the end 31*a* of the twine 31 counter-clockwise into slots 11*a* in the ram 11.

In Fig. 6, ram 11 has begun to move away from the packaging cavity while needles 24 have been moved to a position in which the tying operation is effected.

Fig. 7 shows the ram 11 at the extent of its return stroke, the package of newspapers has been tied, and a new length of string has been brought up from the tying operation to start a new package.

It is to be understood that the relationship between the various elements as set forth above is not exact but is given to show generally the cooperation between the parts during the packaging operation.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

A counting and packaging machine for papers and the like comprising a conveyor for supplying papers to the machine, a transfer carriage comprising a rack mounted adjacent the end of said conveyor to receive papers from the conveyor, a packaging chamber disposed in spaced relation to the conveyor end, means pivotally mounting said transfer carriage for movement between the paper receiving position adjacent the end of said conveyor and a paper discharge position in the packaging chamber, said means including a motor having a rotatable shaft, a fractional revolution clutch connecting the shaft to the carriage, a control element for causing the engagement of the fractional revolution clutch, paper counting means for operating said control element at preselected intervals determined by the papers counted, a package tying arrangement adjacent said packaging chamber, a second fractional revolution clutch connecting said package tying arrangement to said rotating shaft, a second control element for said second clutch, and means connecting said second control element to said counting means for operating said control element at additional preselected intervals determined by the papers counted.



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