Sept. 29, 1953 R. E. TAGGART 2,653,435

WRAPPER TUCKING MECHANISM

Filed Sept. 8, 1951 2 Sheets-Sheet 1

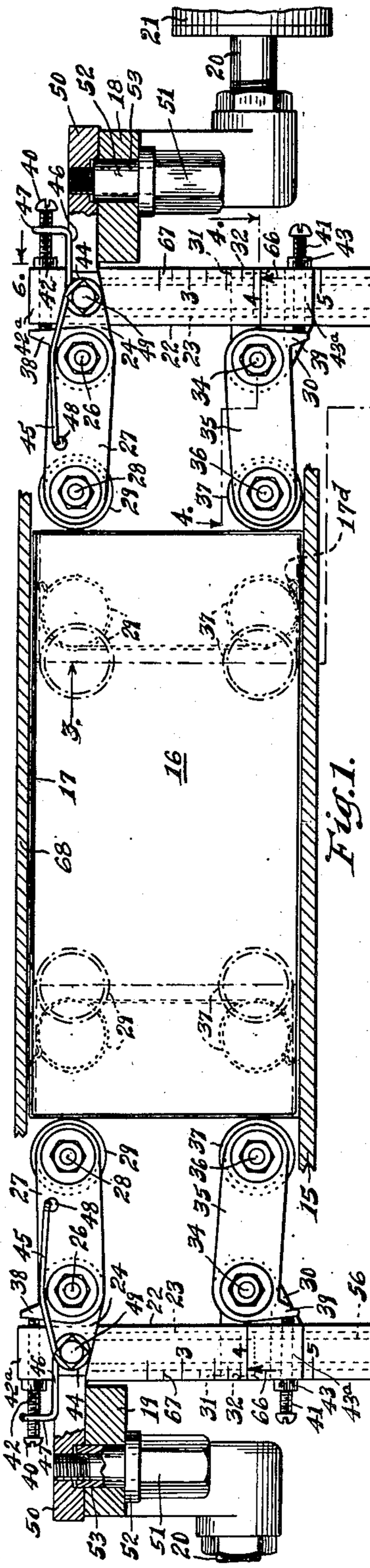


Fig. 1.

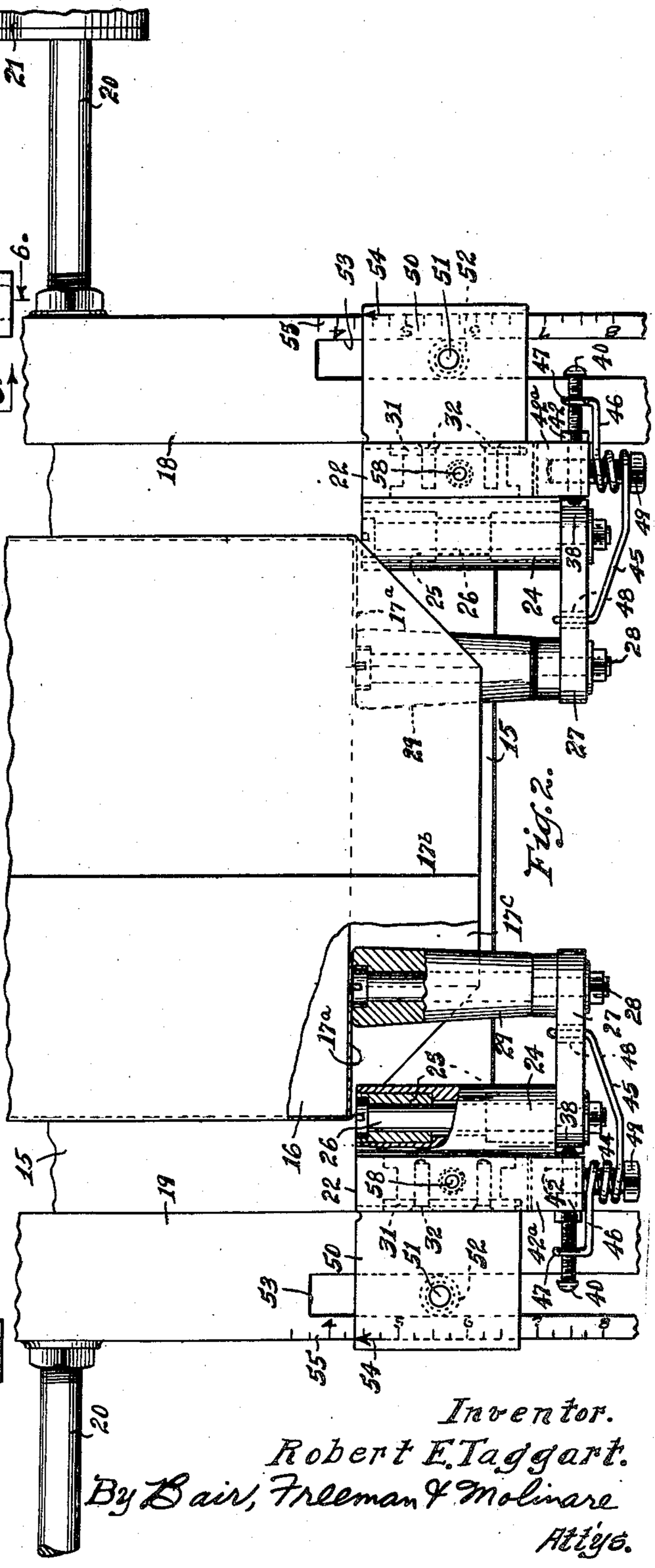


Fig. 2.

Inventor.
Robert E. Taggart.
By Bair, Freeman & Molinare
Attys.

Sept. 29, 1953 R. E. TAGGART 2,653,435

WRAPPER TUCKING MECHANISM

Filed Sept. 8, 1951 2 Sheets-Sheet 2

Fig. 4.

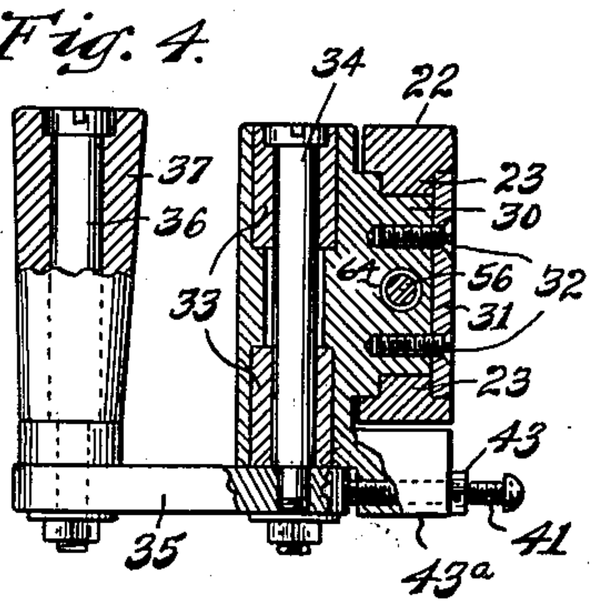


Fig. 6.

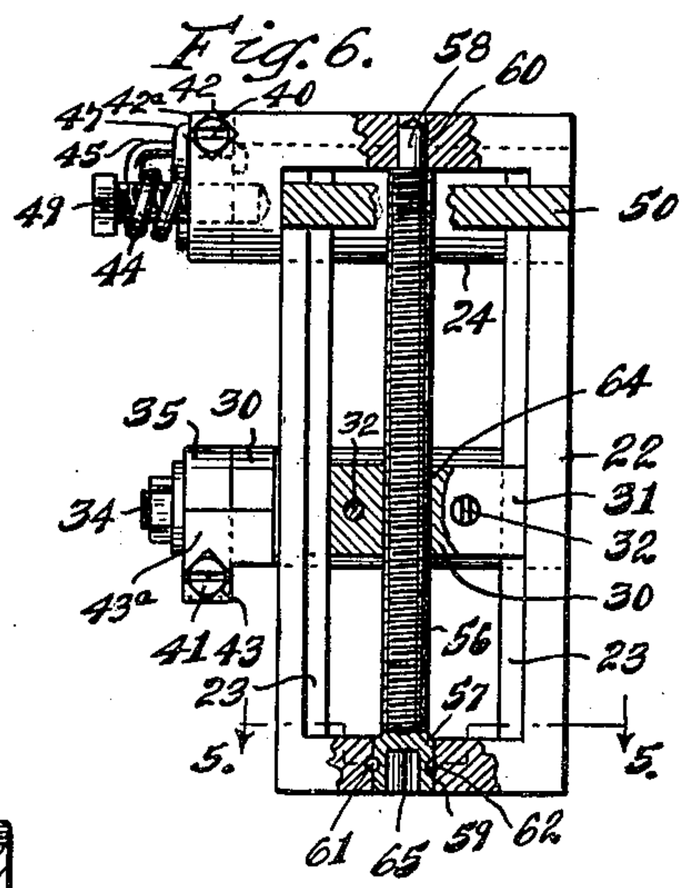


Fig. 5.

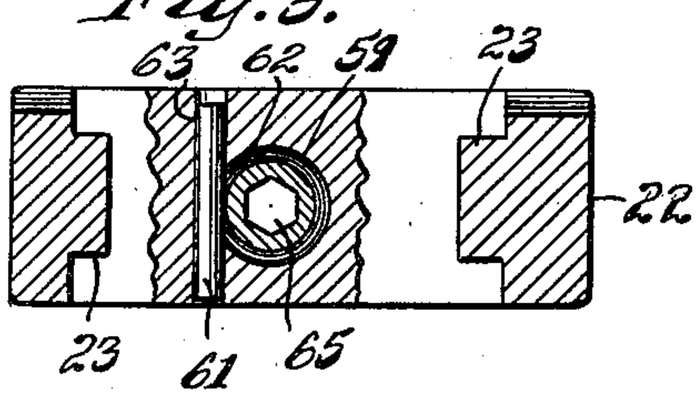
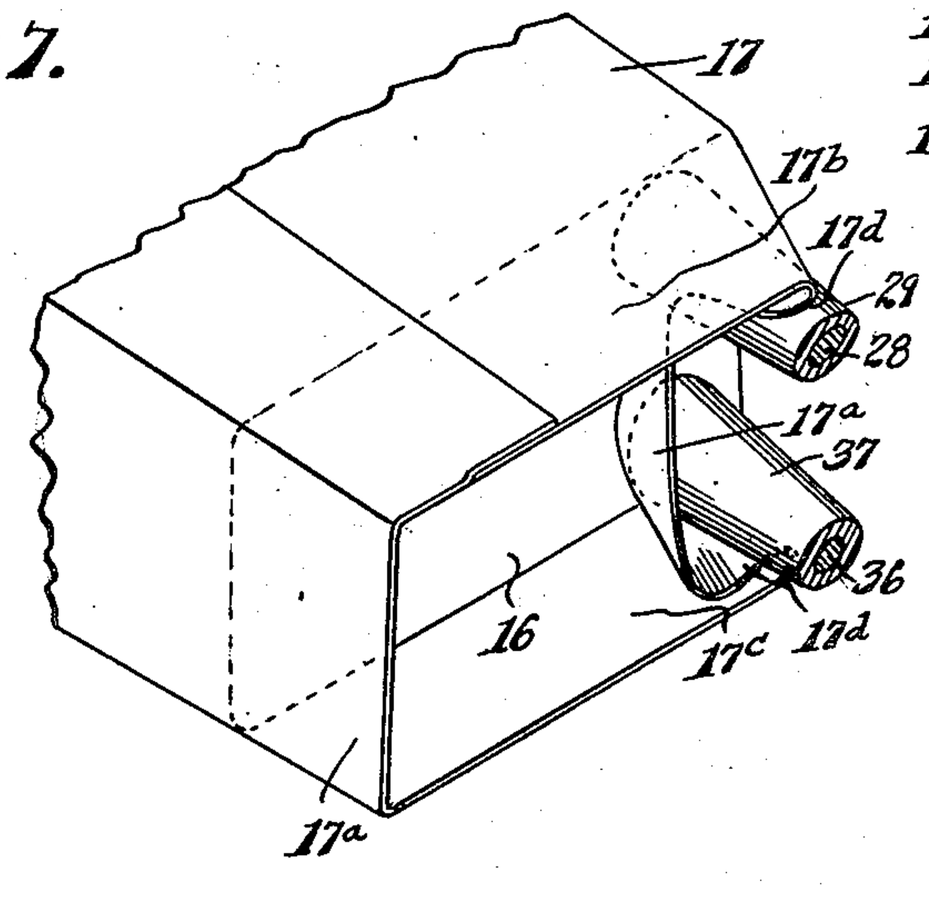
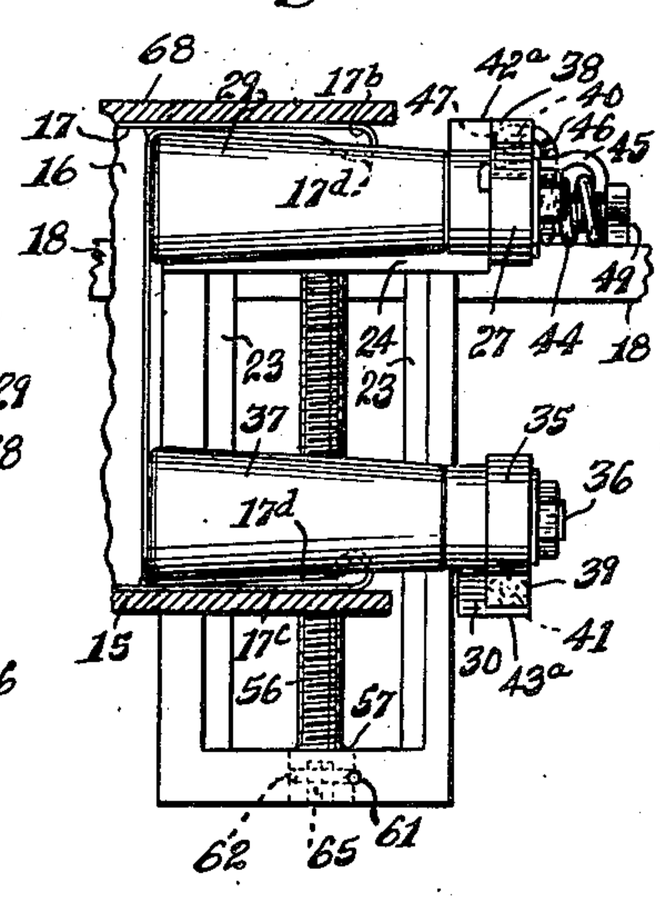


Fig. 3.

Fig. 7.





Inventor.
Robert E. Taggart.
By Bair, Freeman & Molinare
Atty's.

Patented Sept. 29, 1953

2,653,435

UNITED STATES PATENT OFFICE

2,653,435

WRAPPER TUCKING MECHANISM

Robert E. Taggart, Toledo, Ohio, assignor to Lynch Corporation, Anderson, Ind., a corporation of Indiana

Application September 8, 1951, Serial No. 245,675

6 Claims. (Cl. 53—151)

1

This invention relates to a wrapper tucking mechanism particularly adapted for use in connection with a machine for wrapping paper of the type shown in the Stevens Patent No. 2,292,-487, issued August 11, 1942, and as further disclosed in the copending application of Doepel and Wiley, Serial No. 103,875, filed July 9, 1949.

One object of the present invention is to provide wrapper tucking mechanism having an improved and simplified means for adjusting tucking elements relative to each other for larger or smaller packages as desired.

Another object is to provide scale and pointer means for indicating the size of the package so that once the size is known the wrapper tucking mechanism can be quickly adjusted to that size.

Still another object is to provide tucking elements which are pivotally mounted and which are biased to a maximum pivoting limit so that that tucking elements can readily tuck in the ends of a wrapper on a package of paper or other article being wrapped.

A further object is to provide tucking elements including rollers for engaging the wrapper to accomplish the tucking in operation so as to minimize friction of the tucking elements against the wrapper and provide for an efficient tucking in of the wrapper ends by the tucking elements. These rollers are particularly needed when wrapping relatively large packages which require relatively thick wrapping paper and the flaps after being folded by the tuckers tend to spring back or unfold.

Still a further object is to provide the rollers of tapered construction with their large ends adjacent the ends of the package so as to crease the wrapping paper and iron out the tucked-in flaps of the wrapper, and with their small ends projecting away from the package to permit rolling of the tucked ends of the wrapper properly into position without interfering with the tucking action on the wrapper.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my wrapper tucking mechanism, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in the accompanying drawings, wherein:

Figure 1 is an end view of a package with my improved wrapper tucking mechanism illustrated by solid lines in position for starting the tucking operation.

Figure 2 is a plan view of Figure 1 showing the tucking elements at their final position in the tucking operation.

2

Figure 3 is a vertical sectional view on the line 3—3 of Figure 1 showing the tucking elements in the position of Figure 2 (with the tucking operation completed).

Figure 4 is a detail horizontal sectional view on the line 4—4 of Figure 1.

Figure 5 is an enlarged detail horizontal sectional view on the line 5—5 of Figure 3.

Figure 6 is a vertical detail sectional view on the line 6—6 of Figure 1; and

Figure 7 is a perspective view showing the coaction of tucking rollers of my invention with the ends flaps of a wrapper during the tucking-in operation thereof.

On the accompanying drawings I have used the reference numeral 15 to indicate a supporting plate or surface of the packaging machine for an article 16 such as sheets of paper, a book or the like to be packaged in a wrapper 17. A top plate 68 opposes the plate 15. At previous stations in the machine, the wrapper has been wrapped around four surfaces of the article 16 and it remains for the end portions 17*a* of the wrapper to be tucked in as in Figures 2 and 7 which would leave upper and lower flaps 17*b* and 17*c*. These flaps are subsequently bent downwardly and upward respectively at further stations of the machine and glued in position for completing the wrapping of the article 16.

The packaging machines shown in the Stevens patent and in the Doepel and Wiley application include supporting bars 18 and 19 for four sets of tucking elements, two of which are shown in Figures 1 and 2. The other two are at the opposite ends of the package, the center line of the package being substantially coincident with a piston rod 20 extending from a cylinder 21, one of which is provided for each of the supporting bars 18 and 19 to move them from the position shown in Figure 1 to the position shown in Figure 2 to accomplish the tucking operations on the flaps 17*a*.

Each tucking unit comprises a support 22 which as shown in Figure 6 is substantially a rectangular frame provided with vertical guide ribs 23. At the top of the support 22 is a stationary bearing 24 provided with bearing sleeves 25. A pivot bolt 26 is oscillatably mounted in the bearings 25 and supports an upper arm 27. A roller shaft 28 is supported by the upper arm 27 and an upper tucking roller 29 is rotatable thereon. The roller 29, it will be noted, is tapered, being largest at the end adjacent the article 16 as shown in Figure 2 and the purpose of this will hereinafter appear.

A second bearing 30 is slidable with respect to the supporting frame 22 and has a cover plate 31

secured thereto as by screws **32** (see Figure 4) so that the bearing **30** is guided on the guide ribs **23**. The movable bearing **30** is provided with bearing sleeves **33** in which a pivot bolt **34** is oscillatably mounted and supports a lower arm **35**. A roller shaft **6** is supported thereby and rotatable on this shaft also is a tucking roller which I will refer to as the lower tucking roller **37**.

I provide means for limiting the upward pivoting of the upper arm **27** and downwardly pivoting of the lower arm **35** in the form of stop lugs **38** and **39** formed on the arms as shown in Figure 1 and engaging adjustable stop screws **40** and **41** respectively. Lock nuts **42** and **43** respectively are provided for retaining the adjustment and the screws **40** and **41** are threaded in bosses **42***a* and **43***a* of the supporting frame **22** and the bearing **30**. Gravity biases the arm **35** downwardly to be limited by the stop screw **41**, the weight of both the arm **35** and the lower roller **37** accomplishing this result; whereas to counteract gravity and bias the upper arm **27** upwardly, I provide a coil spring **44** having arms **45** and **46**. The arm **45** is engaged in a hole **48** of the arm **27**; whereas the arm **46** of the spring has a hook **47** hooking around the stop screw **40**. The coil of the spring is wound around a stud **49** extending from the boss **42***a*.

The two supports **22** on each supporting bar **18** and **19** are adjustable toward each other for a shorter package or away from each other for a longer package. This is accomplished by providing a supporting plate **50** secured to the frame **22** and threaded to receive a clamp stud **51** as shown in Figure 1 which extends through a flanged bushing **52** located in a slot **53** of the bar **18** or **19** as the case may be. The clamp studs **51** may be loosened and the tucking elements adjusted as required for the size of package being wrapped, a pointer **54** on the supporting plate **50** cooperating with a scale **55** on the supporting bar as shown in Figure 2 to readily indicate the size.

The tucking mechanism is also adjustable for the thickness of the package by raising the lower tucking roller **37** for a thinner package or lowering it for a thicker package. I provide a conveniently operable means to accomplish this adjustment consisting of a threaded rod **56** having a head **57** and a reduced end **58** as shown in Figure 6. The head and the reduced end are rotatable in holes **59** and **60** in the upper and lower cross members of the support **22** and the rod is held against axial movement by a dowel pin **61** cooperating with a groove **62** in the head **57** and located in a hole **63** in the lower cross member of the support **22** as shown in Figures 5 and 6. The intermediate threaded portion of the rod **56** is located in a tapped opening **64** of the bearing **30**. The head **57** is provided with a socket **65** so that a suitable wrench or crank may be associated therewith for rotating the threaded rod **56**, thus raising or lowering the bearing **30** and with it the lower arm **35** and the lower tucking roller **37** as required.

To indicate the adjustment just referred to, the boss **43***a* is provided with a pointer **66** as shown in Figure 1 to cooperate with a scale **67** on the support **22**.

Practical operation

After the adjustments are made at the studs **51** for the length of the article being wrapped and at the threaded rods **56** for the thickness of the article, the parts of the tucking mechanism may be substantially in the position of Figure 1

previous to a tucking operation. The tucker units are adapted to be moved toward each other for bending in the end flaps **17***a* as shown in Figure 7 and by dotted lines in Figure 1. During this operation the large ends of the rollers iron out the wrinkles in the wrapper and crease the wrapper closely adjacent the ends of the article **16**, and the ends of the top and bottom flaps **17***b* and **17***c* are rolled in above the upper roller and below the lower roller as indicated at **17***d* in Figure 7 and by dotted lines in Figure 1. Finally, the rollers reach the position shown by dot-and-dash lines in Figure 1 which is the same position illustrated in Figure 2 with the end flaps **17***a* entirely tucked in and leaving only the upper and lower flaps **17***b* and **17***c* to be folded against the ends of the package and glued in position at a subsequent station in the packaging machine.

In the Doepel and Wiley application, flat tucking blades were used for this operation but I have found that rollers operate much better, minimizing the tendency to tear the wrapper and doing a better job of ironing down the flaps **17***a*. This is particularly true in connection when relatively thick packages are being wrapped by the machine.

The pivotal mounting of the arms **27** and **35**, together with the spring and gravity biasing of the arms to their maximum spread as shown in Figure 1 provide for some movement of the rollers toward each other to clear the rolling edges **17***d* of the end flaps **17***a* during the tucking in operation, and in the final position of Figure 2 spreads them to their maximum position for smoothly ironing out any wrinkles, particularly adjacent the ends of the article **16**, by close engagement of the large ends of the tapered rollers therewith as shown in Figure 3. The lower roller presses the lower flaps **17***c* tightly against the supporting surface **15**; whereas the upper roller performs a similar pressing operation against the top plate **68** and the result is a smoothly tucked-in wrapper ready for the upward and downward bending of the lower and upper flap **17***c* and **17***d*.

My improved wrapper tucking mechanism increases the efficiency of the machine and also of the operator inasmuch as it shortens the time required for adjusting the machine due to the use of the rod **56** in conjunction with the pointer **66** and scale **67** instead of using clamp screws for this purpose as shown in the Doepel and Wiley application. The tucking action is considerably improved due to the use of tucking elements which are pivotally mounted and biased to a maximum spread, and the use of rollers in connection with the tucking elements also provides for smoother operation during the tucking of the wrapper ends against the ends of the article being wrapped.

Some changes may be made in the construction and arrangement of the parts of my wrapper tucking mechanism without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. Tucking mechanism for one of the end flaps of a rectangular tubular wrapper comprising a support, a pair of tucking elements, one for one side of said end flap and mounted stationary on said support, and the other for the other

side of said end flap and mounted for movement on said support toward said first tucking element for small diameter packages and away from said first tucking element for larger diameter packages, the direction of such movement being substantially parallel to said diameter, said tucking elements being also movable together toward the axis of an article being wrapped in the wrapper for tucking said end flap, said other tucking element and said support having cooperating scale and pointer means to indicate the diameter of the package, means for effecting said first mentioned movement of said other tucking element relative to said support comprising a rod threaded in said other tucking element and rotatable relative to said support, and means constraining said rod against axial movement relative to said support.

2. Tucking mechanism for one of the end flaps of a rectangular tubular wrapper comprising a support, a pair of tucking elements, one for one side of said end flap and mounted stationary on said support, and the other for the other side of said end flap and mounted for movement on said support toward said first tucking element for small diameter packages and away from said first tucking element for larger diameter packages, the direction of such movement being substantially parallel to said diameter, said tucking elements being also movable together toward the axis of an article being wrapped in the wrapper for tucking said end flap, said tucking elements including an upper pivoted arm, a roller carried thereby, a lower pivoted arm, a roller carried thereby, plates in opposition to said rollers and cooperating therewith to roll creases into the top and bottom edges of said end flap, means limiting the pivotal movement of said arms to a maximum spread between said rollers with the rollers pressing said flap edges against said plates, and spring means biasing said upper arm upwardly toward its limit means, said lower arm being biased downwardly by gravity toward its limit means.

3. Tucking mechanism for one of the end flaps of a rectangular tubular wrapper comprising a support, a pair of tucking elements, one for one side of said end flap and mounted stationary on said support, and the other for the other side of said end flap and mounted for movement on said support toward said first tucking element for small diameter packages and away from said first tucking element for larger diameter packages, the direction of such movement being substantially parallel to said diameter, said tucking elements being also movable together toward the axis of an article being wrapped in the wrapper for tucking said end flap, said tucking elements including an upper pivoted arm, a tapered roller carried thereby, a lower pivoted arm, a tapered roller carried thereby, means limiting the pivotal movement of said arms to a maximum spread between said rollers, and means biasing said arms toward their limit means, said tapered rollers having their larger ends directed toward the package being wrapped.

4. Tucking mechanism for one of the end flaps of a rectangular tubular wrapper comprising a support, a pair of tucking elements, one for one side of said end flap and mounted stationary on said support, and the other for the other side of said end flap and mounted for movement on said support toward said first tucking element for small diameter packages and away from said first tucking element for larger diameter packages, the direction of such movement being substantially parallel to said diameter, said tucking elements being also movable together toward the axis of an article being wrapped in the wrapper for tucking said end flap, said tucking elements including a pair of arms pivoted to said support, means limiting the pivotal movement of said arms to a maximum spread, and means for biasing said arms toward their limit means.

5. In a wrapper tucking mechanism, a support, a stationary bearing thereon, a second bearing movable relative to said support, upper and lower arms for said bearings, a pivot bolt oscillatably mounted in each bearing and carrying its respective arm, a roller shaft carried by each arm, a tucking roller rotatable on each roller shaft, said movable bearing and said support having cooperating scale and pointer means to indicate the size of the package, means for moving said second bearing relative to said support for adjusting purposes comprising a rod threaded therein and rotatable and non-slidable relative to support, means limiting the pivotal movement of said arms to a maximum spread between said rollers, spring means biasing said upper arm upwardly toward its limit means, said lower arm being biased downwardly by gravity toward its limit means.

6. In a wrapper tucking mechanism, a support, a stationary bearing thereon, a second bearing movable relative to said support, an arm for each bearing, a pivot bolt oscillatably mounted in each bearing and carrying its respective arm, a roller shaft carried by each arm, a tucking roller rotatable on each roller shaft, means for moving said second bearing relative to said support and thereby adjusting the spread of opposite surfaces of said rollers comprising a rod threaded therein and rotatable relative to said support, means constraining said rod against axial movement relative to said support, means limiting the pivotal movement of said arms to a maximum spread between said surfaces, and means biasing said arms toward their limit means, said rollers being tapered and having their smaller ends next to said carrying arms.

ROBERT E. TAGGART.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,118,468	Bradwell	Nov. 24, 1914
1,180,984	Day	Apr. 25, 1916
2,146,997	Smith	Feb. 14, 1939
2,292,487	Stevens	Aug. 11, 1942