

Oct. 7, 1952

A. RUSSELL
WRAPPING MACHINE

2,612,740

Filed April 3, 1951

2 SHEETS—SHEET 1

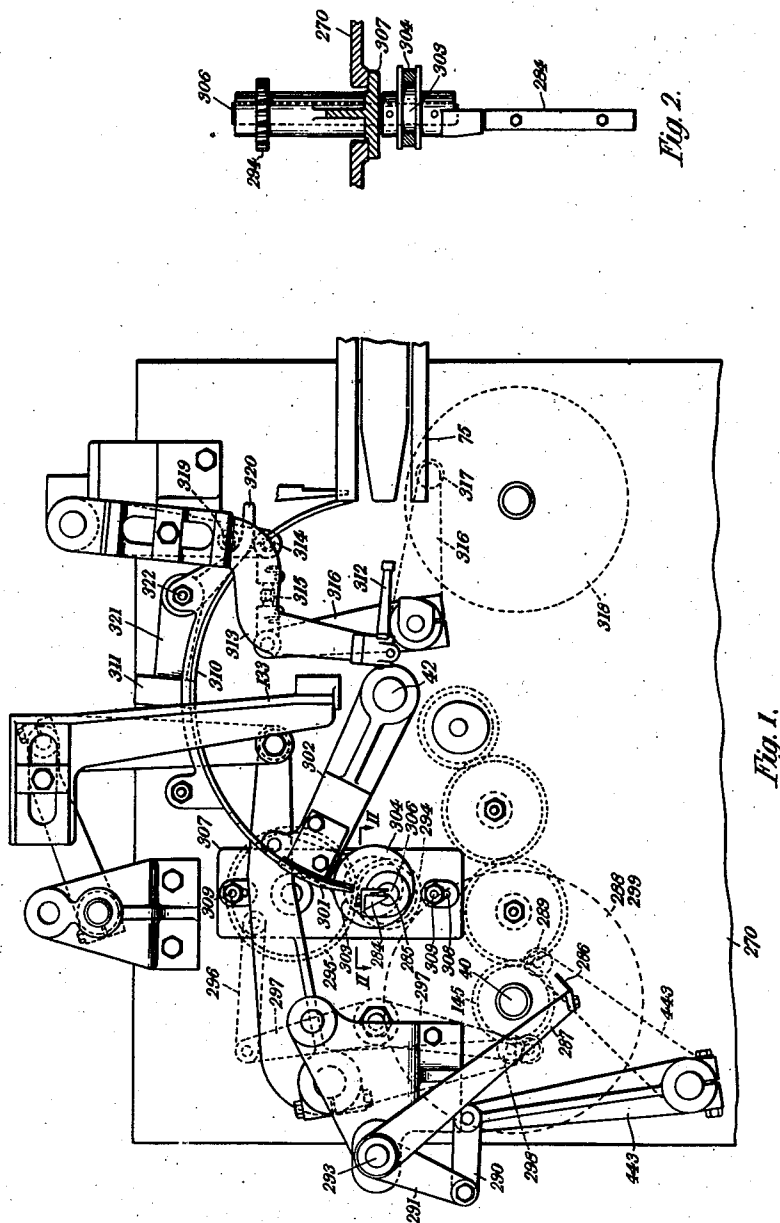


Fig. 1.

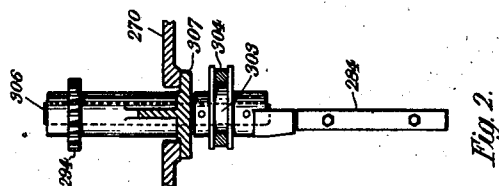


Fig. 2.

INVENTOR
Alexander Russell

By Watson, Cole, Brindle & Watson

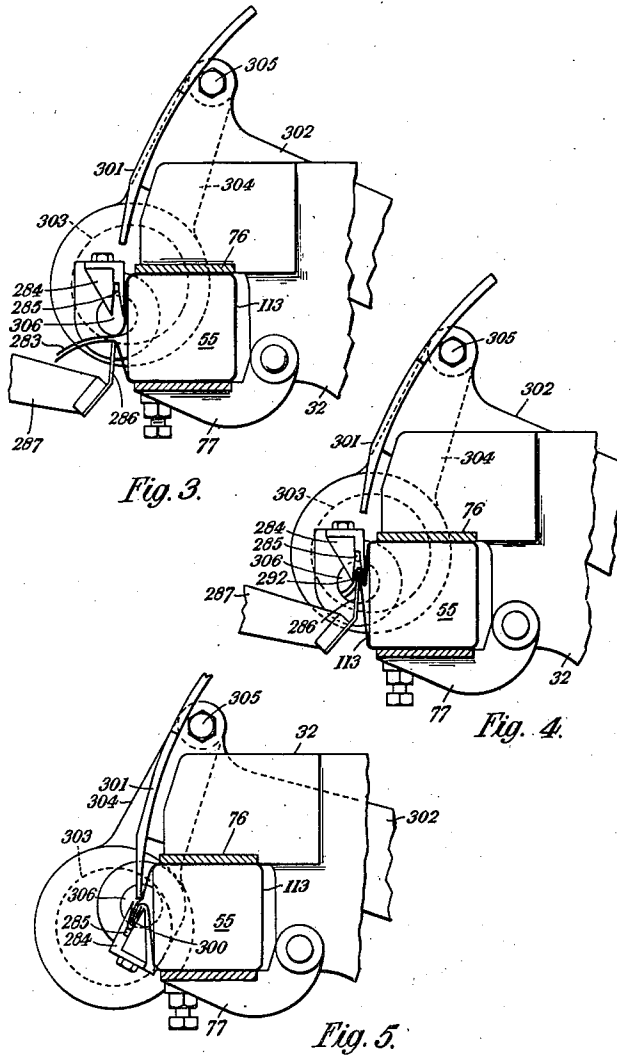
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2 SHEETS—SHEET 2



INVENTOR
Alexander Russell

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UNITED STATES PATENT OFFICE

2,612,740

WRAPPING MACHINE

Alexander Russell, Leeds, England, assignor to
The Forgrove Machinery Company Limited,
Leeds, England, a company of Great Britain

Application April 3, 1951, Serial No. 219,015
In Great Britain April 3, 1950

3 Claims. (Cl. 53-130)

1

The object of this invention is to provide a wrapping machine which will produce a double or druggist fold longitudinally of the package, and, using wrappers of fixed length, will be capable of effectively making such a fold despite variations in the size of the articles to be wrapped.

As hereinafter noted, the invention is particularly concerned with mechanism for producing a double fold around a package consisting of a stack of loose biscuits, or other thin articles of similar shape, and which will be adjustable to suit different shapes and sizes of biscuits.

The machine according to the invention comprises an intermittently moving conveyor for transporting the articles in succession from a loading station to a folding station, means at the loading station for feeding the articles, each with a wrapper folded about it in U-formation, in succession to holders on the conveyor, which holders are brought in succession to the loading station by the movement of the conveyor, a rotary folder at the folding station, a tucker blade operating, as each article arrives at the folding station, to press the projecting wings of the wrapper into a cleft in the rotary folder to form the first portion of the double fold, and means operating after withdrawal of the tucker blade to rotate the folder relatively to the stationary article to form the second portion of the double fold, continued movement of the conveyor thereafter withdrawing the folded portion of the wrapper from the cleft in the folder prior to return of the latter to its initial position.

Preferably a fold retaining blade is provided, this being operated in timed relationship with the rotary folder to press the double folded wrapper against the article as the double fold is withdrawn from the cleft in the rotary folder.

One preferred form of wrapping machine according to the invention will now be described in detail, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a front elevation of part of the machine, with the wrapping wheel removed, showing the mechanism for forming the double fold,

Fig. 2 is a section on the line II-II in Fig. 1, and

Figs. 3-5 are detail views, on a large scale, showing successive positions assumed by the mechanism for forming the double fold.

The machine is fully described in U. S. application Serial No. 219,016, filed April 3, 1951, and those parts only will be described herein which relate to the formation of the double fold.

The machine includes a wrapping wheel 32 (Fig. 3) fixed to a horizontal shaft which is given

2

an intermittent motion by means of a Geneva mechanism, turning through 90° at each step. The wrapping wheel, which is of the construction described in U. S. application Serial No. 219,016, has four holding pockets, each constituted by a fixed jaw 76, a movable jaw 77 spring-pressed towards the fixed jaw as described in said U. S. application, and a pair of tuckers (not shown) for gripping the end biscuits of a stack of biscuits contained within the pocket.

The stacks of biscuits (one of which is indicated at 55 in Fig. 3) are lifted in succession into the pockets at the bottom position of the wrapping wheel, which constitutes the loading station, a wrapper (shown at 113 in Fig. 3) being fed, by any suitable wrapper feed mechanism, into position between the lifter and the wrapping wheel at each cycle of operation of the lifter, so that the wrapper is carried by the article into the pocket and thereby folded in U-formation about the article.

The wrapping wheel then rotates through 90° to bring the stack of biscuits to a folding station. Here, as indicated in Fig. 3, the upper projecting wing 283 of the wrapper comes into contact with a rotary folder 284 (see also Fig. 1) constituted by a pair of folding blades forming a cleft 285 between them. An oscillating tucker blade 286, carried by an arm 287 fixed to a shaft 293, receives movement from a cam 288 on a cam shaft 40 through the agency of a follower 289, a bell crank 443, a link 290 and an arm 291 fixed to the shaft 293, and after the wrapping wheel pocket has arrived at the folding station the tucker blade 286 moves, as shown in Fig. 3, to force the projecting wings of the wrapper into the cleft 285 between the blades of the folder 284, thereafter retiring to its initial position. The blades of the folder 284 are slightly bevelled to provide a lead for the entry of the wrapper and tucker blade 286 into the cleft 285 and to avoid any danger of the wrapper being dragged out of the cleft by friction as the tucker blade 286 retires. The forcing of the wrapper into the cleft 285 forms the first part 292 of a double fold in the wrapper, as shown in Fig. 4.

It will be appreciated that the amplitude of movement of the tucker blade 286 into the cleft 285 determines the width of the double fold made in the wrapper. Also the action of the tucker blade 286 forcing the wings of the wrapper into the cleft 285 tends to tighten the wrapper around the package. Adjustment of the effective stroke of the tucker blade 286 and therefore of the extent to which it will penetrate into the cleft 285

and the width of the double fold, can be readily effected by adjusting the position of the tucker blade arm 287 in relation to the shaft 293.

The rotary folder 284 is connected to a gear wheel 294 engaging a toothed wheel 295 which is now rocked, by a link 296 and bell crank 297, carrying a follower 298 engaging a double fold rotation cam 292 on the cam shaft 40, to rotate the rotary folder 284 away from its initial position, in which the cleft 285 faces downwardly, to a position shown in Fig. 5 in which the cleft 285 faces upwardly and inwardly. This action forms the second part of the double fold and brings the rotary folder 284 into a position such that the wrapper can be withdrawn from it on further movement of the wrapping wheel. During such further movement a fold retaining blade 301 presses the double folded wrapper against the package as the double fold 300 is pulled out of the cleft 285 between the blades of the rotary folder 284. This retaining blade 301 is mounted on an arm 302 pivoted to the wrapping wheel shaft 42 and coupled to the rotary folder by an eccentric 303 fixed to the rotary folder, a link 304 embracing the eccentric and a pin 305. This coupling brings the retaining blade 301 into the operative position shown in Fig. 5, when the rotary folder 284 is rotated into the discharge position, and returns the retaining blade 301 into inoperative position when the rotary folder 284 is afterwards turned back into its initial receiving position (Fig. 3), this action taking place after the wrapper has been withdrawn from the rotary folder. The rotary folder 284 is adjustable for height in relation to the wrapping wheel shaft, so as to accommodate it to packages of different sizes. To this end, the rotary folder 284, the shaft 305 carrying it, and the oscillating gear wheel 295 are mounted on a plate 307 having slots 308 engaging bolts 309 for securing the plate to the machine frame member 270, so that the plate 307 can be adjusted in a vertical direction in relation to the machine frame.

The above-described mechanism for forming the double fold is adapted for use with a considerable range of wrapping materials, will accommodate a considerable degree of variation in the size of the package, and is readily adjustable to vary the width of the double fold.

When the package is oversize, there is a minimum amount of projecting wrapper, and a relatively short length of wrapper will be pushed into the cleft 285 of the rotary folder. The first fold, produced by the introduction of the wings of the wrapper into the cleft, will therefore be of less width than the second fold, formed by folding the projecting parts of the wrapper down towards the article by the rotation of the folder. In the case of a package of mean size, these two folds will be of substantially equal width. In the case of an undersize package, however, an excess amount of wrapper will project and the effect will be to produce a triple fold, the extra fold being produced by a portion of wrapper which is pressed against the package by the folder blade nearest the article as the rotary folder moves into the position shown in Fig. 5.

An arcuate plate 310 extends around the wrapping wheel between the folding station and the pressing station. Here a heated sealing member 311 (Fig. 1) is caused to descend on the double fold. This heat sealing member, which is moved from the ejector mechanism which will shortly be described, presses resiliently on the

double fold 300 and forms a heat seal in the package at that point. Where a non-heating sealing wrapping material is used, e. g. parchment paper, the heat sealing member is not heated and serves merely to press the double fold. The effect of heat sealing the double fold is to lock the wrapper securely to the package, so that it cannot come off except if it be torn.

The next step of movement of the wrapping wheel brings the package to a discharge station. Here a cam operated ejector plunger 312 acts to force the package out of the wrapping wheel and on to a discharge platform 75. The ejector plunger 312 is mounted on an arm 313 fixed to an arm 314. The arm 314 is coupled by a link 315, which is adjustable in length to vary the stroke of the ejector plunger, to a bell crank 316 carrying a follower 317 coacting with a cam 318 on a cam shaft 41. The arm 314 carries a roller 319, which coacts with a tail 320 on the top presser arm 321 to rock the latter about its pivot 322 and so imparts the necessary movements, under control of the cam 318, to the heat sealing top presser 311.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a wrapping machine for wrapping stacks of loose biscuits and the like, the combination of a wrapping wheel mounted to rotate on a horizontal axis, said wrapping wheel having a plurality of biscuit-receiving pockets, each pocket comprising a fixed jaw extending radially in relation to the axis of rotation of said wheel and a movable jaw, means for intermittently rotating said wheel to cause said pockets to transport in succession to a folding station stacks of biscuits each with a wrapper folded in U-formation about it, a rotary folder at said folding station mounted for rotation about an axis parallel to the axis of the wrapping wheel, said rotary folder being located, on arrival of a pocket at said folding station, adjacent one jaw of the pocket and having a cleft facing the other jaw of said pocket, a pivotally mounted tucker blade, a cam, an adjustable linkage coupling said tucker blade to said cam, said cam being operative while a pocket is dwelling at said folding station to move said tucker blade into the cleft in said rotary folder, thereby pressing the projecting wings of the wrapper into said cleft, and thereafter to retract said tucker blade, a second cam, means connecting said second cam to said rotary folder and operable by said second cam, after retraction of said tucker blade, to rotate said rotary folder through substantially 180° and to return said rotary folder to its initial position after said wrapping wheel has moved to withdraw the wrapper from the cleft in said rotary folder, a plate supporting said rotary folder, a machine frame member, and means for effecting vertical adjustment of said plate on said frame member and thereby adjusting the position of the axis of rotation of said rotary folder in relation to the fixed jaw of the pocket dwelling at said folding station.

2. In a wrapping machine for wrapping loose biscuits and the like, a combination as claimed in claim 1, wherein the means connecting said second cam to said rotary folder comprises a bell crank, a follower on the bell crank coacting with the second cam, a gear wheel mounted for rotation on said plate, a link pivotally connected at its opposite ends to said bell crank and to said gear wheel and a toothed wheel fixed to the rotary folder and meshing with said gear wheel.

3. In a wrapping machine for wrapping loose biscuits and the like, a combination as claimed in claim 1, comprising a pivoted fold retaining blade, an eccentric fixed to the rotary folder, and a link embracing said eccentric and pivoted to said fold retaining blade, said eccentric being operative, on rotation of said rotary folder, to move said fold retaining blade into position to press the fold in the wrapper against the stack of biscuits during withdrawal of said fold from the cleft in said rotary folder.

ALEXANDER RUSSELL.

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