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L. L. SALFISBERG ET AL

2,653,434

MACHINE FOR PACKAGING ODD-SHAPED PRODUCTS

Filed Oct. 28, 1950

5 Sheets-Sheet 1

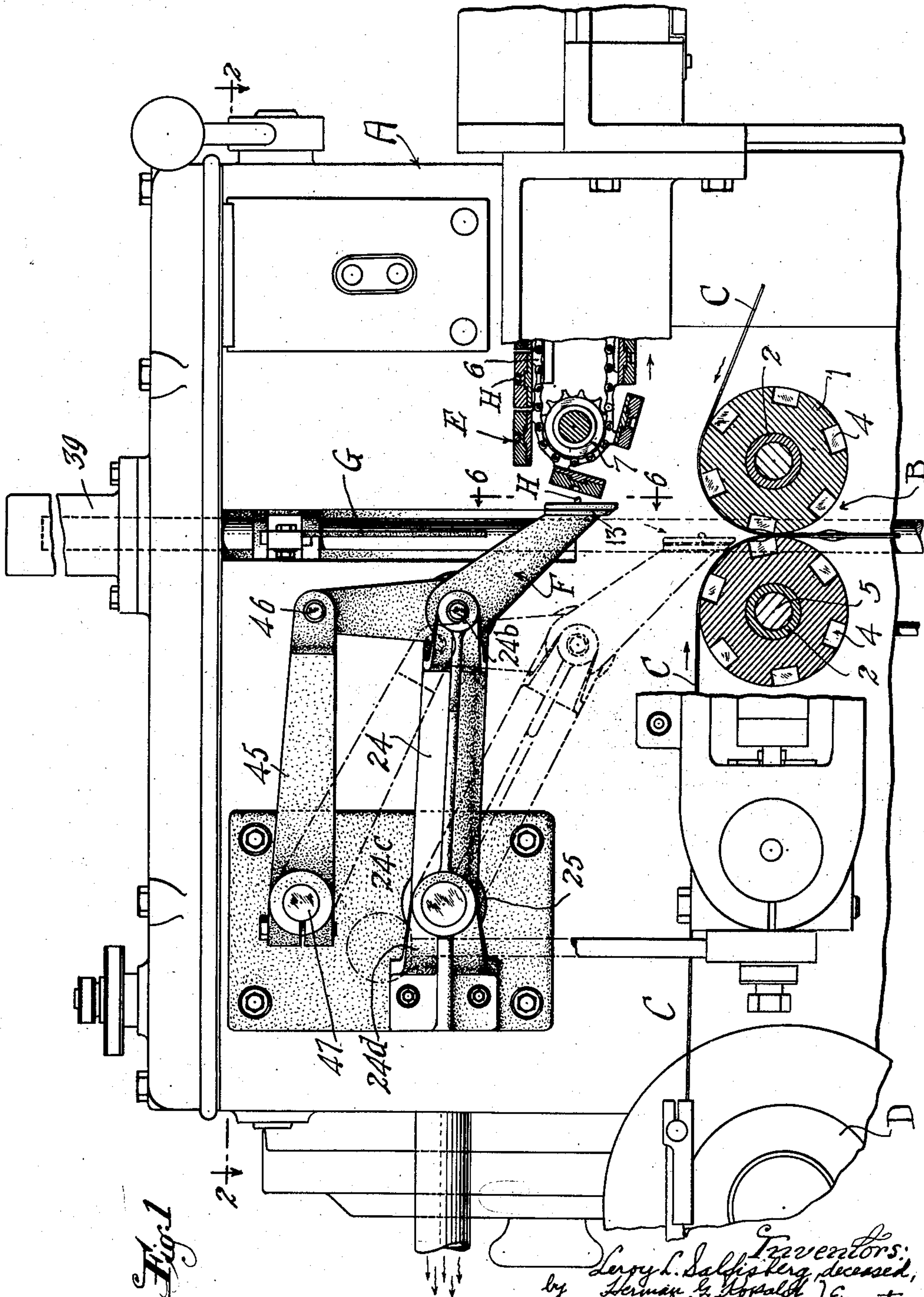


Fig. 1

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5 Sheets-Sheet 2

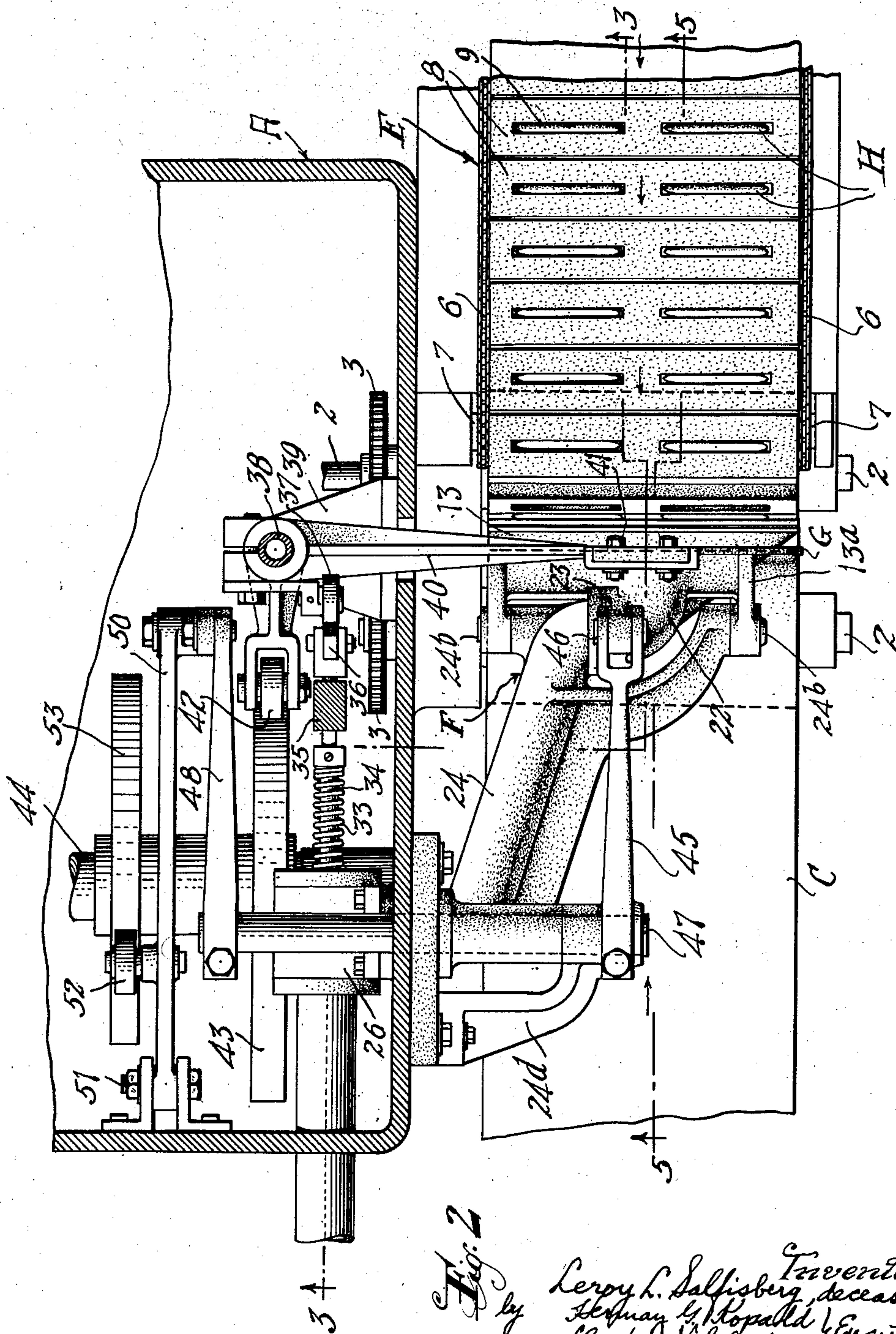


Fig. 2

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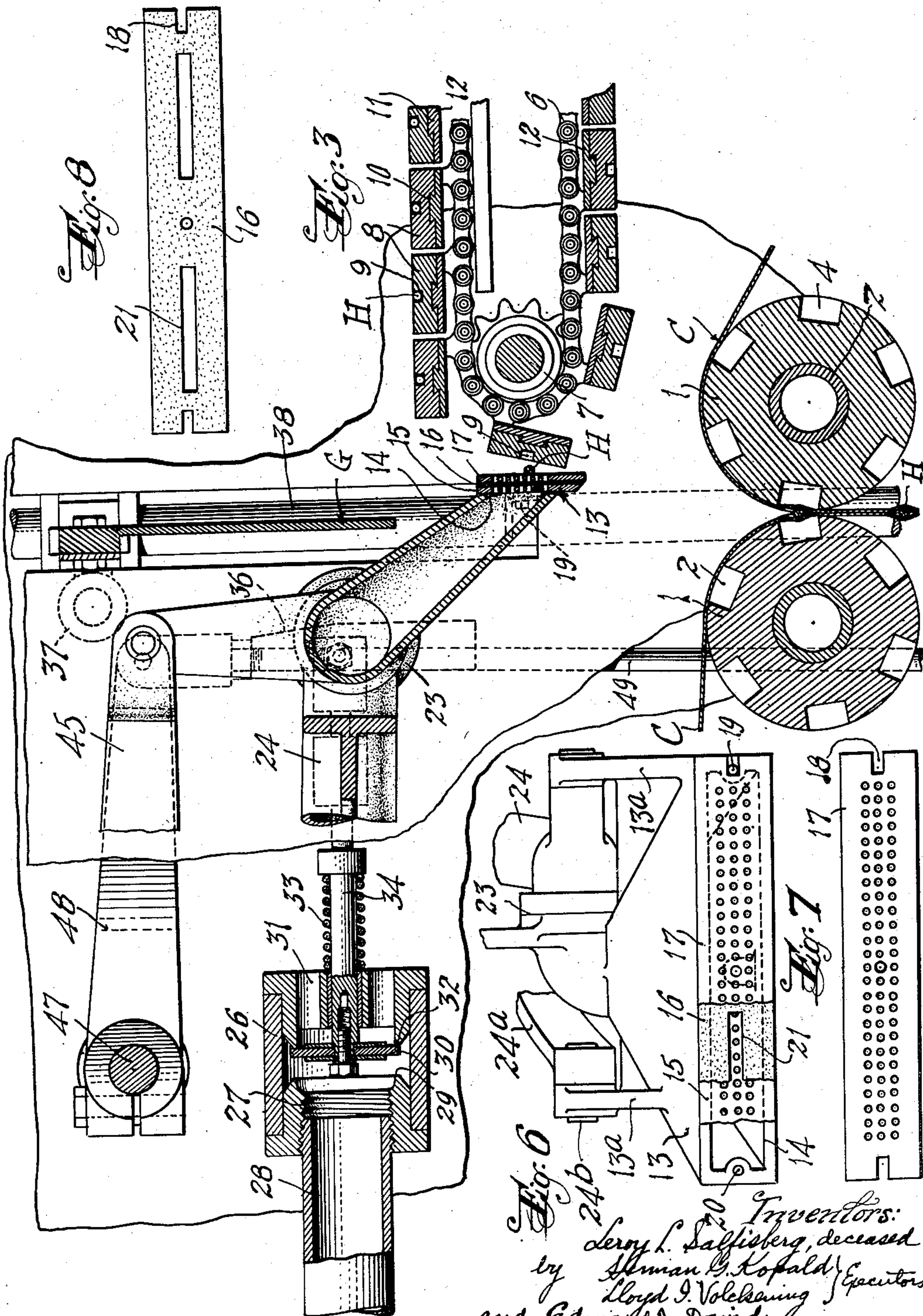
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5 Sheets-Sheet 3



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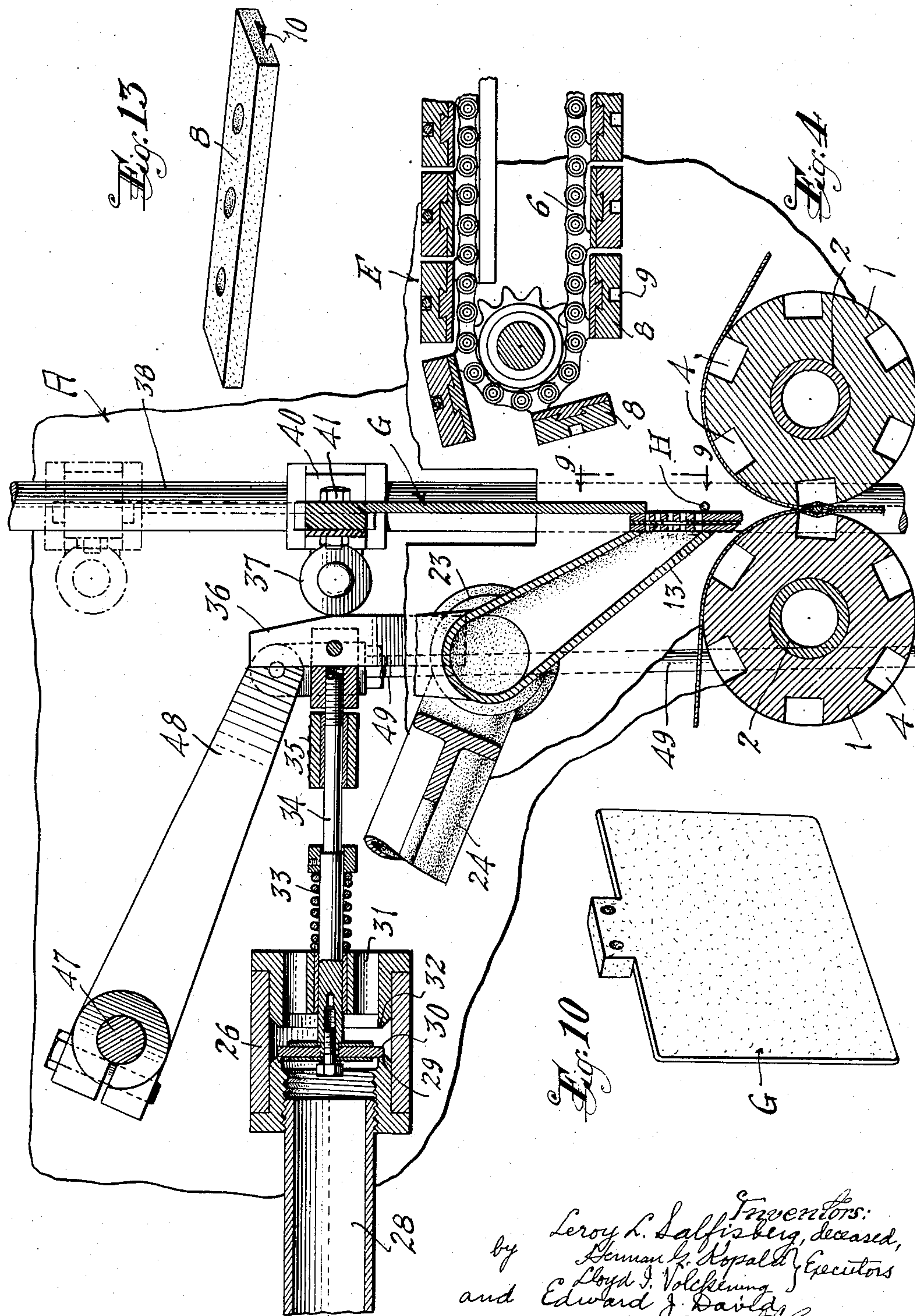
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MACHINE FOR PACKAGING ODD-SHAPED PRODUCTS

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,653,434

MACHINE FOR PACKAGING ODD-SHAPED PRODUCTS

Leroy L. Salfisberg, deceased, late of South Orange, N. J., by Herman G. Kopald, New York, N. Y., and Lloyd I. Volckening, Glen Ridge, N. J., executors, and Edward J. David, Hillside, N. J., assignors to Ivers-Lee Company, Newark, N. J., a corporation of Delaware

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7 Claims. (Cl. 53—86)

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This invention relates in general to packaging machines wherein two layers of flexible packaging material such as chlorinated rubber or metal foil are drawn from supply rolls into juxtaposed closely spaced relation adjacent an article feeding and depositing mechanism which deposits articles between the layers, after which the layers are sealed together around the articles in zones that form and bound pockets or compartments between the layers in which the articles are enclosed.

Heretofore, it has been difficult if not practically impossible to package odd-shaped products in this way, and a prime object of the present invention is to provide a novel and improved method and apparatus for feeding and depositing odd-shaped articles between the packaging layers before the latter are sealed together.

It is particularly desirable that each odd-shaped article be located between the packaging layers in a predetermined position, and therefore another object of the invention is to provide novel and improved means for depositing and holding the article in a predetermined position between the layers so that as the layers are sealed together all of the articles will be enclosed in the same relation to their respective compartments.

A further object of the invention is to provide in such a machine a novel and improved combination of a feeding conveyor for the articles and a suction transfer nozzle for transferring the articles from the conveyor to the predetermined position between the layers of packaging material whereby the articles can be quickly, efficiently and accurately packaged.

Other objects, advantages and results of the invention will be brought out by the following description when considered in conjunction with the accompanying drawings in which:

Figure 1 is a schematic fragmentary side elevational view of a machine embodying the invention, portions being shown in vertical longitudinal section;

Figure 2 is a composite horizontal sectional and top plan view of the machine shown in Figure 1, approximately from the plane of the line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary longitudinal vertical sectional view approximately on the plane of the line 3—3 of Figure 2 showing the removal or pick-up of the article by suction member from the feeding conveyor;

Figure 4 is a similar view showing the parts of the machine in a position between the pick up

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position and the position at which the article is deposited between the layers of packaging material;

Figure 5 is a vertical longitudinal sectional view approximately on the plane of the line 5—5 of Figure 2;

Figure 6 is a fragmentary front elevational view of the pick-up member approximately from the plane of the line 6—6 of Figure 1 with portions broken away;

Figure 7 is a detached front elevational view of the face plate of the pick-up member;

Figure 8 is a front elevational view of a mask for the pick-up member;

Figure 9 is a front elevational view of the suction pick-up member and a portion of the pusher for orienting and pushing the article from the pick-up member into the space between the layers of packaging material, taken approximately on the plane of the line 9—9 of Figure 4;

Figure 10 is a detached perspective view of the pusher plate;

Figures 11 and 12 are views similar to Figure 9 showing modified forms of the pusher plate for handling articles of different shapes; and

Figure 13 is a detached perspective view of one of the article-carrying plates of the feeding conveyor.

Specifically describing the illustrated embodiment of the invention, the machine comprises a main frame or casing A on which is mounted a sealing mechanism B of generally-known type, for example such as shown in United States Patent No. 2,083,617, dated June 15, 1937. As shown, this sealing mechanism includes two sealing rollers 1 mounted on and rotated in opposite directions by shafts 2 which are drivingly connected by gears 3 one of which may be driven from any suitable source of power. The rollers have complementary registering recesses 4 to provide clearance spaces between them for the articles between the layers or webs C of packaging material, which are drawn by and between the rollers 1, the recesses being spaced circumferentially of the rollers and the rollers being rotated in timed relation to the deposit of the articles between the layers. In surrounding relation to the recesses 4, the peripheries of the rollers have serrated surfaces for clamping the layers of the packaging material and the rollers may be heated in any suitable manner as by electric heaters 5 where the packaging material is of the heat-sealable type. As shown, the layers or webs of packaging material may be fed from supply rolls

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D that are journaled on the machine in any suitable known manner.

The articles to be packaged are placed on a feeding conveyor E in any suitable manner and the conveyor carries the articles to a suction transfer member F which is operated in timed relation to the movement of the articles by the conveyor so that each article is lifted from the conveyor by the transfer member F and deposited between the layers of packaging material C, the articles being oriented and pushed from the suction transfer member by a pusher plate G.

More particularly, the feeding conveyor E comprises a pair of parallel chains 6 mounted in known manner on sprockets one of which for each chain is shown and denoted 7. On and between the chains 6 are mounted a plurality of spaced article carrying blocks 8 each of which has a pocket or recess 9 for at least one article H, the blocks preferably being interchangeable so that different pockets can be provided for articles of different shape. As shown, the blocks have dovetail grooves 10 in their bottom surfaces into which fit dovetail ribs 11 of plates 12 carried by the chains, so that the blocks can be applied to and removed from the plates 12 by simple longitudinal movement of the blocks to slide them onto or off the dovetail ribs.

The conveyor is driven by any suitable means continuously so as to bring the blocks with their respective articles into juxtaposition to the pick-up member F so that the latter may remove the article from the pocket. As shown, the suction pick-up member includes a suction head 13 having an approximately rectangular opening 14 of a length greater than the width of the packaging layers C and of a width greater than the length of the article to be packaged. Detachably secured to the suction head in overlying relation to the opening 14 is a rear perforated plate 15 over which is separably arranged a mask sheet 16 which in turn is overlaid by a perforated face plate 17. As shown, the plates 15 and 17 and the sheet 16 have notches 18 through which cap screws 19 may be threaded into openings 20 in the suction head for attaching the plates and sheet to the head. The perforations of the plates 15 and 17 are closely spaced and uniformly arranged so as to apply suction to any article placed against the surface of the face plate, while the mask sheet 16 has one or more openings 21 corresponding approximately in shape to the article to be packaged. As shown in Figures 1 to 8 inclusive, the articles H are elongate penicillin sticks and the openings 21 are horizontally disposed slots corresponding in width and length to the diameter and length, respectively, of the articles. The suction head is hollow and at its rear end has a tubular elbow 22 that is swivel connected at 23 to one end of a pipe 24 the other end of which is swivel connected at 25 to the casing 26 of a control valve which has a port 27 connected by a pipe 28 to a suitable suction producing apparatus. The suction head is firmly pivotally connected to the pipe 24 by bearing lugs 13a on the suction head and arms 24a on the pipe which are pivoted together by pins 24b on the same axis as the elbow connection 23. Preferably the suction pipe 24 has an auxiliary bearing in the form of a trunnion 24c journaled in a bearing pocket 24d fastened to the main frame. The port 27 has a valve seat 29 with which cooperates a reciprocable head 30 when the latter is in one position as shown in Figure 4; and the valve casing 26 has ports 31 opening to the atmosphere which are controlled

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by engagement of said valve 30 with another valve seat 32 when the valve head is in its other position as shown in Figure 3.

The valve head 30 is urged to the seat 32 by a compression spring 33 and is actuated off that seat through a valve rod 34 which is slidably mounted in the valve casing 26 and in a bracket 35 on the machine frame A and has a cam block 36 with which cooperates a follower roller 37 carried by a pusher mechanism which includes a rod 38 vertically slidable in bearings 39 on the machine frame and carrying an arm 40 to which the pusher plate G is connected by bolts 41. With this arrangement the valve head 30 is moved from one position to the other in timed relation to the movement of the pusher plate which is actuated by a follower roller 42 connected to the vertical rod 38 for leading a cam 43 carried by a drive shaft 44 which is rotated by any suitable source of power. With this construction, the valve head 30 is moved from one position to the other in timed relation to the reciprocation of the pusher plate.

The suction head 13 is swung up and down and simultaneously horizontally by an arm 45 which is pivotally connected at one end at 46 to the elbow 22 and is fast connected at its other end to a container shaft 47 journaled in the machine frame A and to which another arm 48 is rigidly connected. The arm 48 is in turn connected by a rod 49 to one end of the lever 50 the other end of which is pivotally connected at 51 to the machine frame, said lever having a roller 52 journaled thereon and following a cam 53 on the drive shaft 44.

The pusher plate G may be formed of any suitable material but where the articles are easily broken or damaged, the plate preferably will be a sheet of rubber, and the lower edge of the sheet will be shaped roughly to correspond to the shape of the article being packaged. For example as shown in Figure 9 the edge of the pusher sheet is straight so as to engage the straight sides of the penicillin sticks H, whereas in Figure 11 the edge of the pusher sheet is shown as provided with notches 54 to more accurately orient the articles J, especially to definitely locate the articles longitudinally of the face plate. In Figure 12 the edge of the pusher sheet is shown as shaped to conform to another type of article such as an ampule K. In each case, the shape of each of the pusher sheets is such as to line up the articles with their longer dimensions exactly horizontal so that it will be deposited between the packaging layers in proper relation for packaging. If the article happens to be misplaced on the suction head as shown at the left hand side of Figure 9, as the pusher sheet descends it will straighten out or line up the article so that the article will be deposited in proper position between the packaging layers.

In operation of the machine, the articles are placed in the conveyor pockets 9 and moved in succession into juxtaposition to the suction head which is normally in its upper position as shown in Figures 1 and 3. In this position the valve head 30 is engaged with the seat 32 to close communication of the valve casing with the atmosphere and the suction is applied through the pipe 28 through the suction head so as to draw the article H from the pocket 9 against the face plate as shown. Then the suction head is moved downwardly and to the left, being swung downwardly about the axis of the swivel connection 25 through the arm 45 and being swung to the left about the axis of the elbow connection 23.

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At the same time, the pusher plate will be moved downwardly so as to engage the article on the face plate of the suction head as shown in Figure 4. If the article is fragile, the cam block 36 will be so shaped and positioned that the valve head 30 will engage the seat 29 and cut off the suction to permit the article to drop by gravity from the suction head, but the pusher plate will be moved at a more rapid rate than the article so that it will reach and orient the article before the latter is dropped between the packaging layers as shown in Figure 5. If the article cannot be injured by the pusher plate, for example if it is hard and rigid like a pencil or a metal saw, the suction may be maintained on the suction head so that the pusher plate will slide the article along the face of the suction head while the article is being held on the head by the suction.

While we have shown the invention as embodied in certain specific structural details, it should be understood that this is primarily for illustrating the principles of the invention and that many modifications and changes can be made in the construction of the machine within the spirit and scope of the invention.

We claim:

1. In a packaging machine which includes means for moving two webs of packaging material to bring portions thereof into close juxtaposition to each other to receive articles in succession between them and means for sealing said layers together in zones each surrounding an article to enclose the articles between said layers, the addition of means for feeding said articles in succession into a position adjacent said juxtaposed portions of said layers, a suction transfer member to transfer said articles from said feeding means and into a position between said juxtaposed portions of said layers of packaging material, and a pusher to engage and follow said articles from said suction transfer member into position between said layers of packaging material.

2. In a packaging machine as defined in claim 1, said suction transfer member having a flat perforate face against which said articles are held by suction, and said pusher comprises a flat plate parallel to and reciprocable with a wiping action along said face when said suction transfer member is in the position to hold said articles between said layers of packaging material.

3. In a packaging machine as defined in claim 1, the addition of a source of suction connected to said suction transfer head, and means operated in timed relation to the movement of said pusher to cut off the suction from said transfer head and release said articles immediately prior to the engagement of the articles by said pusher.

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4. A packaging machine including means for supplying and feeding packaging material in opposed layers, article feeding means for depositing articles between said opposed layers comprising mechanism for feeding articles in succession to a predetermined point, a suction transfer head for transferring said articles in succession from said point to a position between said opposed layers of packaging material and a pusher reciprocable in timed relation to the movement of said transfer head to engage and follow said articles from said transfer head into position between said layers of packaging material, and means for sealing said layers together in zones encircling the articles to enclose the articles between said layers.

5. In a packaging machine the combination of a movable head for transferring articles from one position to another, said head having a perforate face in contact with which said articles are held by suction during their transfer, a flat pusher plate, and means for actuating it into sliding contact with said face of the suction head when the latter is in said another position, said pusher plate having an edge to engage and orient an article on said face.

6. The combination as defined in claim 5, with the addition of a source of suction connected to said transfer head, and means actuated in timed relation to the movement of said pusher plate to cut off the suction from said transfer head in predetermined timed relation to the engagement of said edge of the pusher plate with the article.

7. The combination as defined in claim 5 with the addition of means for actuating said transfer head including a pipe swivel connected at one end to said transfer head and swivel connected at its other end to a suction pipe, said transfer head having arms, a lever connected at one end to said arms, and means for swinging said lever about its other end.

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Executors of the last will and testament of Leroy L. Salfisberg, deceased.

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