Dec. 9, 1952 S. MESSINA 2,620,958

MACHINE HAVING DIVERGENTLY RELATED BAG SUPPORTING CONVEYER FOR FILLING SUCH BAGS WITH DISCRETE OBJECTS

Filed April 12, 1948 5 Sheets-Sheet 1

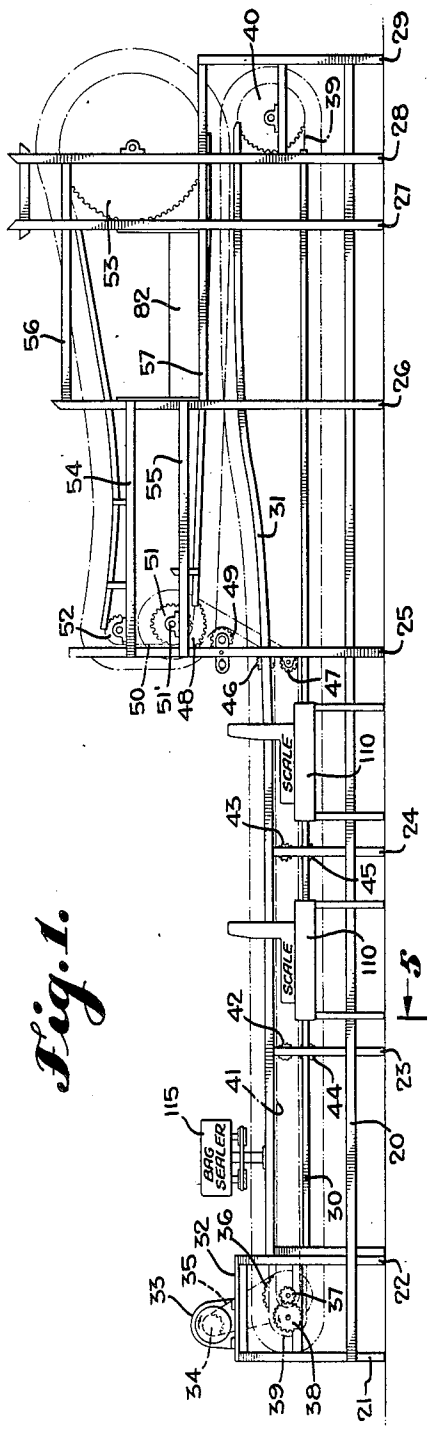


Fig. 1.

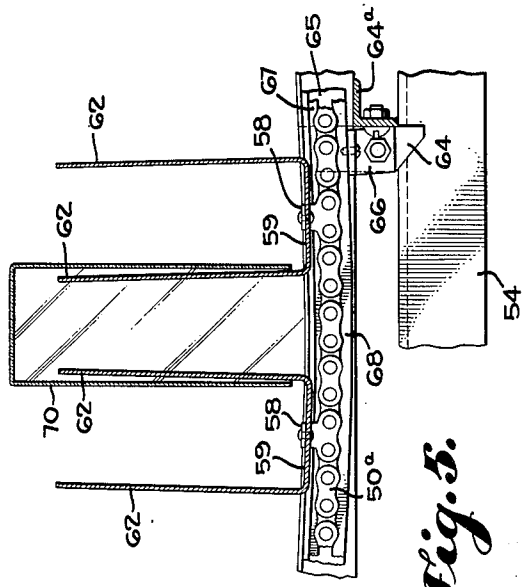


Fig. 5.

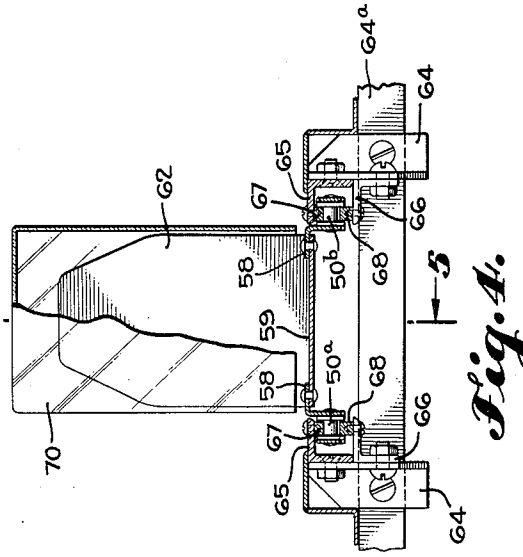


Fig. 4.

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Filed April 12, 1948 5 Sheets-Sheet 2

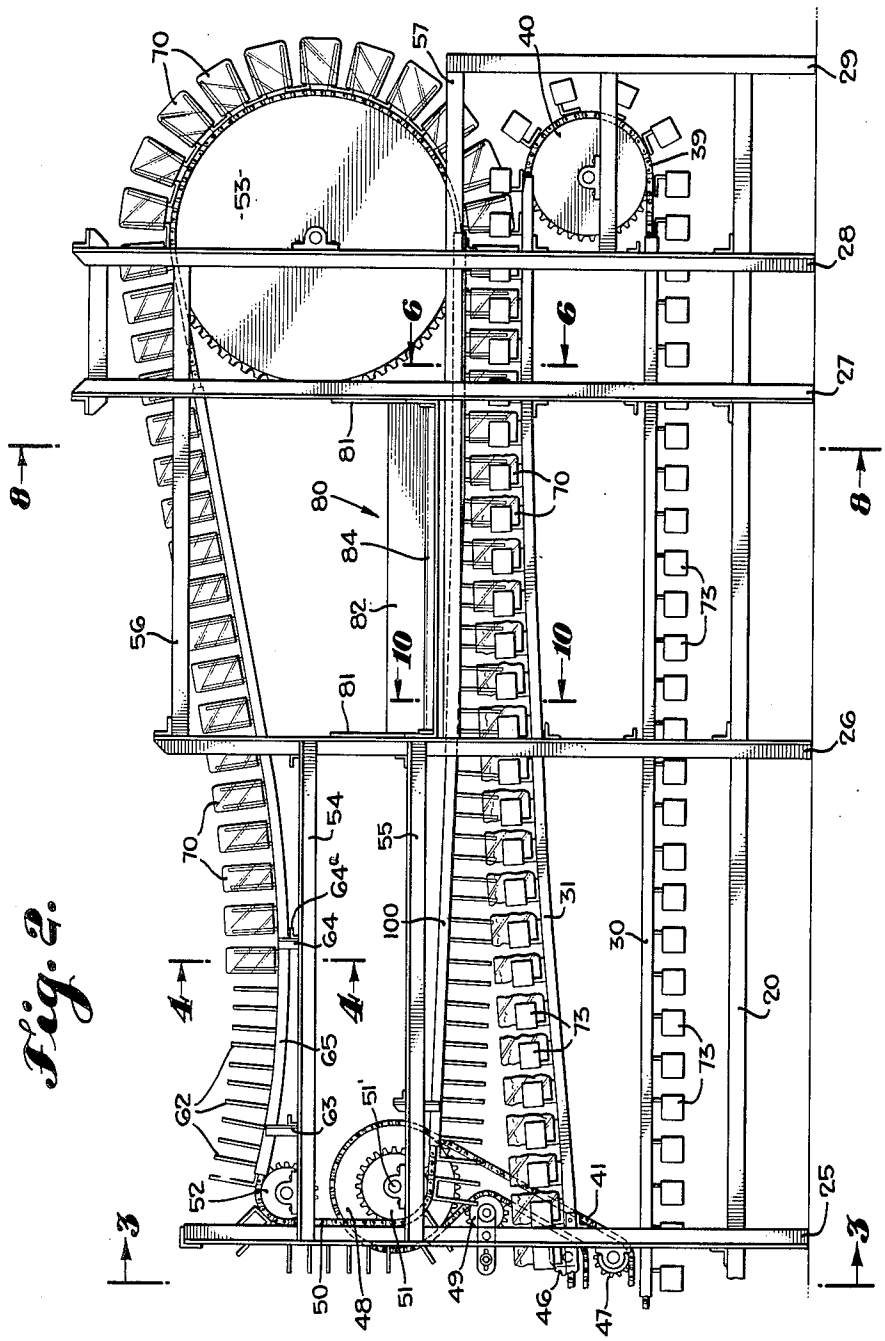


Fig. 2.

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Filed April 12, 1948 5 Sheets-Sheet 3

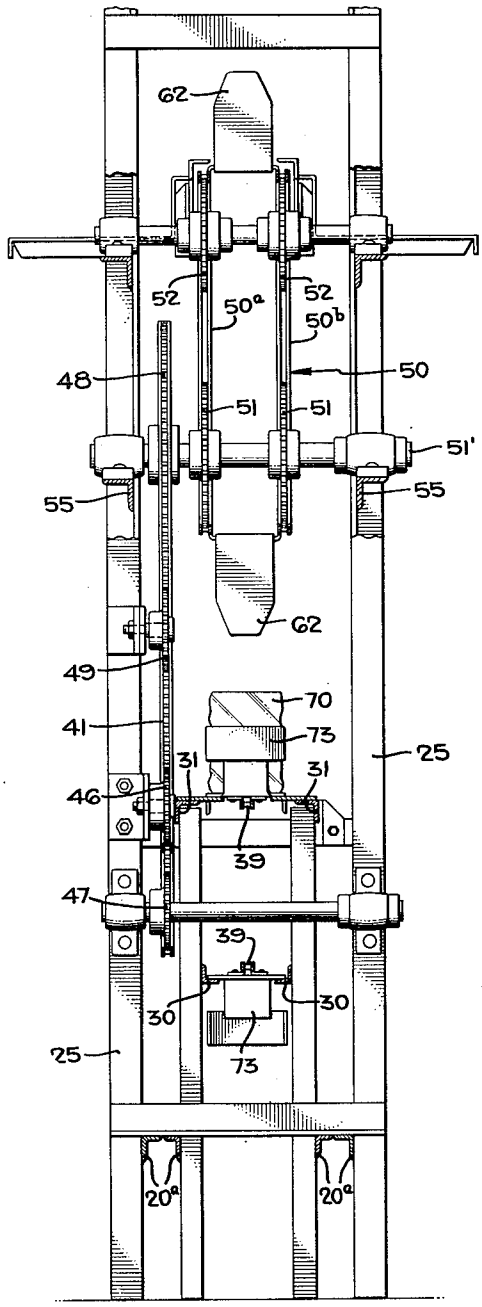


Fig. 3.

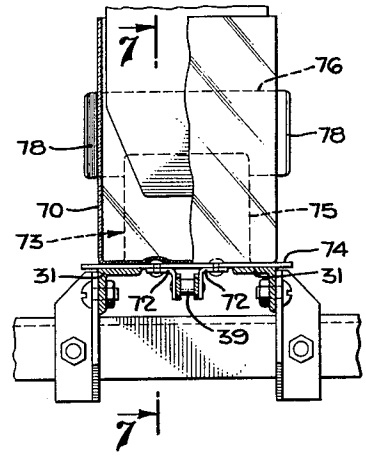


Fig. 6.

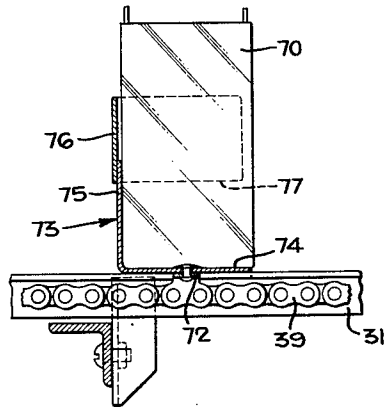


Fig. 7.

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Filed April 12, 1948 5 Sheets-Sheet 4

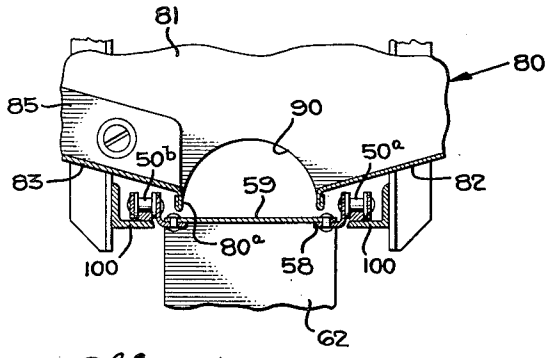


Fig. 10.

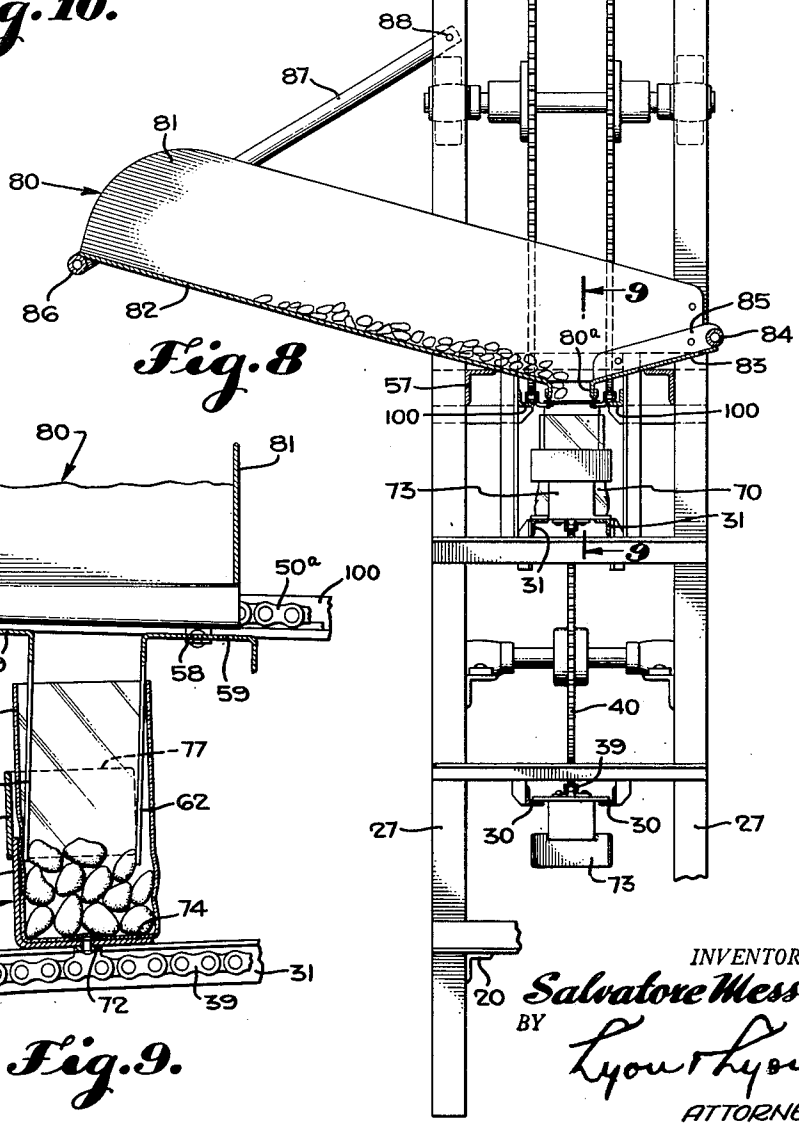


Fig. 8

Fig. 9.

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MACHINE HAVING DIVERGENTLY RELATED BAG SUPPORTING CONVEYER FOR FILLING SUCH BAGS WITH DISCRETE OBJECTS

Filed April 12, 1948 5 Sheets-Sheet 5

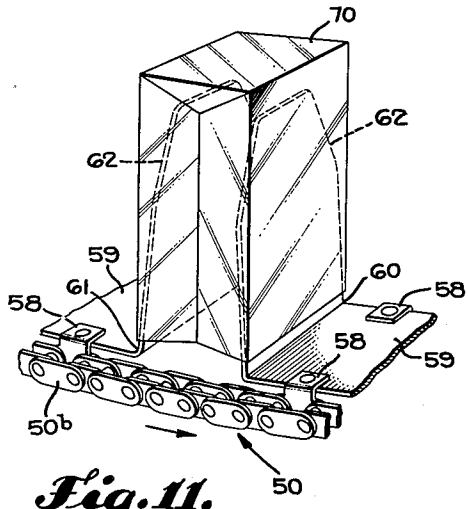


Fig. 11.

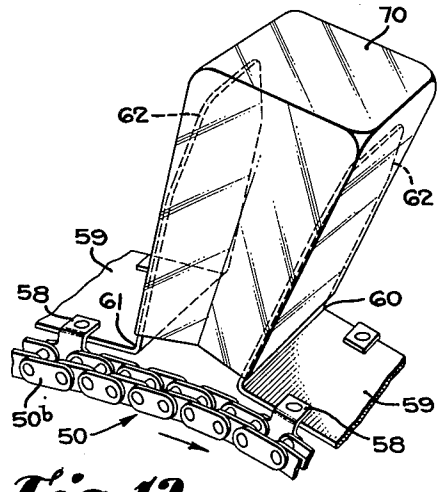


Fig. 12.

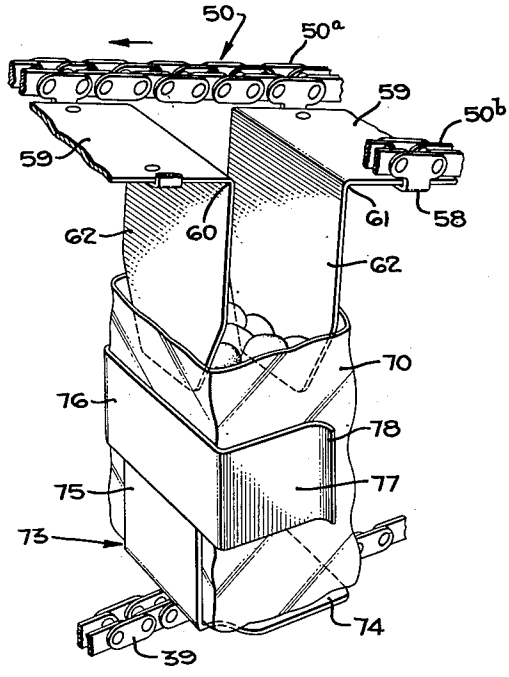


Fig. 14.

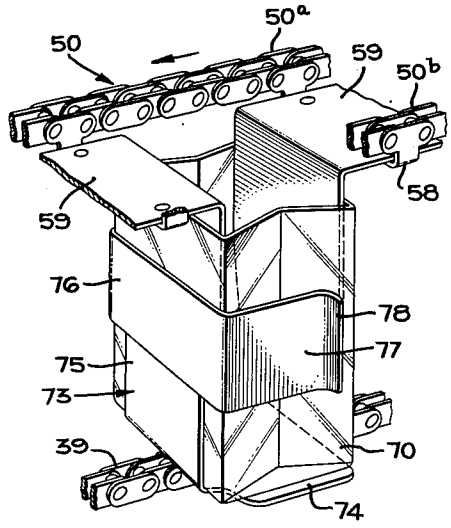


Fig. 13.

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Patented Dec. 9, 1952

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UNITED STATES PATENT OFFICE

2,620,958

MACHINE HAVING DIVERGENTLY RELATED BAG SUPPORTING CONVEYER FOR FILLING SUCH BAGS WITH DISCRETE OBJECTS

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Application April 12, 1948, Serial No. 20,502

10 Claims. (Cl. 226—59)

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This invention relates to a packaging machine, and more particularly to a packaging machine in which an endless chain on which are mounted upstanding fingers is provided for the reception of a continuous supply of open bags, preferably of cellophane or Pliofilm, which endless chain presents the bags to a filling hopper at which point the bags are filled and removed from the chain, being conveyed therefrom to a checking station.

While the invention is adaptable to a more general use, it has been found particularly useful in the packaging of dried fruits.

It is accordingly one object of this invention to provide a packaging machine of the type described in which bags are continuously and automatically presented to a filling hopper and filled with the article to be packaged. It is another object of this invention to provide a packaging machine of the type described in which the filled bag is automatically removed from the initial bag holder and carried by suitable mechanism from the filling hopper.

These and other objects and advantages of the invention will be apparent from the annexed specification, in which:

Figure 1 is a side elevation of the packaging machine;

Figure 2 is an enlarged fragmentary side elevation of the machine shown in Figure 1;

Figure 3 is an enlarged section taken on the line 3—3 of Figure 2;

Figure 4 is a section taken along the line 4—4 of Figure 2;

Figure 5 is a section taken along the line 5—5 of Figure 4;

Figure 6 is a section taken along the line 6—6 of Figure 2;

Figure 7 is a section taken along the line 7—7 of Figure 6;

Figure 8 is an enlarged section taken on the line 8—8 of Figure 2;

Figure 9 is a section taken along the line 9—9 of Figure 8;

Figure 10 is an enlarged section taken on the line 10—10 of Figure 2;

Figure 11 is an enlarged perspective elevation of the roller chain and bag-carrying fingers in one position of its travel;

Figure 12 is a perspective elevation similar to Figure 11 showing the mechanism in a further position of its travel;

Figure 13 is a perspective elevation of the mechanism shown in Figure 12 showing the filled bag-carrying mechanism in a further position of travel; and

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Figure 14 is a perspective elevation similar to Figure 13 in a still further position of travel.

Referring now more particularly to the drawings, the mechanism comprises a frame comprising identical front and rear frame members, only one of which is shown in Figure 1 and described. Each side of the frame includes a horizontal member 20, shown in Figure 2, as composed of a pair of angle bars 20*a* forming a channel and also upright angle bars 21, 22, 23, 24, 25, 26, 27, 28 and 29. The frame also includes a further angle bracket 30 and another angle bracket 31 formed as indicated. As in the previous case, other angle brackets similar to the angle brackets 30 and 31 are disposed on the other side of the machine.

Mounted on a top piece 32 is a suitable source of power, such as the electro-motor 33, which electro-motor is provided with a sprocket 34 driving a chain 35, which chain leads to a sprocket 36. Sprocket 36 carries a gear 37 driving a gear or sprocket 38. A roller chain 39 engages the sprocket 38, which chain 39 is conveyed as hereinafter described adjacent the angle brackets 30 and 31 and engages the sprocket 40. A further roller chain 41 is driven by a suitable gear or sprocket mounted on sprocket 36 and is led by means of idlers 42, 43, 44, 45, 46, and 47 to a sprocket 48. The chain 41 is maintained under tension by means of the adjustable sprocket or gear 49. A further roller chain 50 is provided engaging the sprockets 51 mounted upon the shaft 51' of the sprocket 48. The chain 50 then passes over the idlers 52 and the sprockets 53. It will be apparent that the motor 33 thus drives the chain 39, the chain 41, and the chain 50. The chain 50 is a double chain, as shown in Figures 11–14 and hereinafter described.

Angle brackets 54, 55 are provided in the framework, it being understood that the brackets 54 and 55 are again duplicated on the other side of the machine. Similarly, angle brackets 56 and 57 are provided which, with the complementary members, complete the framework of the machine.

Referring now particularly to Figures 11, 12, 13 and 14, the roller chain 50 is indicated as in fact comprising a pair of chains 50*a* and 50*b*, and at suitable intervals the chains are connected, as by means of angle brackets 58, to plates 59. The plates 59 are U-shaped, having their ends bent upwardly as at 60 and 61 forming fingers, indicated generally by the numeral 62. The frame member 54 carries a pair of upstanding angle members 63 and 64 on which are mounted an-

gle brackets 65 and 66 to which are attached the rails 67 and 68 upon which the rollers of chains 50*a* and 50*b* travel. A cross angle bar 64*a* is provided for rigidity.

At the point of travel of chain 50 opposite the member 64, the chain 50 is thus depressed, forming a slight curve causing the fingers 62 of two successive plates 59 to be tilted inwardly towards each other as clearly indicated in Figure 5. At this point an operator is stationed who places a cellophane or Pliofilm bag 70 over the fingers 62. As the chain progresses, it straightens out and as the chain 50 passes over sprocket 53, the fingers 62 tend to separate, thus firmly gripping the bag as it is inverted. After passing over the sprockets 53 the chains 50*a* and 50*b* engage rails similar to the rails 67 and 68 mounted in the angle bars 100 in a manner similar to the mounting of rails 67 and 68 in the angle bars 65 and 66 and from there rails pass to the sprockets 51.

The chain 39 is a single chain and supports a bag holder as most clearly shown in Figures 6, 7, 13 and 14. The chain 39 at suitable intervals is provided with pairs of side plates 72 to which are riveted a bag holder 73. The bag holder 73 comprises a bottom portion 74, an end portion 75, and a cross piece 76 which has ends 77 bent at right angles thereto and curved outwardly as at 78. The angle members 31 are spaced apart. Thus the angle members 31 form a support upon which ride the plates 74, and, similarly, the angle member 30 provides a supporting surface for the plates 74 in inverted position, and thus the angle members 30 and 31 define the path of the chain 39.

Referring now to Figures 8, 9 and 10, it is to be noted that a hopper 80 is provided having an elongated opening 80*a*, which opening is disposed above and in the line of the path of the bags secured to the fingers 62 with the bags in the inverted position and supported in the bag holder 73. The hopper 80 has a pair of end members 81 and a pair of oppositely inclined bottom members 82 and 83, the member 83 being shorter in width than the member 82. A tube 84 is welded in brackets 85, which brackets are riveted to the end walls 81, and a similar tube 86 is welded to the bottom 82, as indicated, and a length of pipe 87 is provided joining the tube 86 and secured to the frame member 27 as at 88. The tube 84 serves to stiffen the hopper 80, and the tube 86 and pipe 87 serve to support the outer end thereof from the frame 27. One of the end walls 81 toward the motor end of the machine has a substantially semi-circular opening 90 therein.

The operation of the machine is as follows: Assuming the hopper 80 to be filled with substance to be packed in the bags 70, such as dried fruit or the like, and the motor 33 to be turned on, the chain 35 will drive the sprocket 36, in turn driving the sprocket 38 and the chain 39, as well as the chain 41. The chain 41 in turn drives the sprocket 48 and also the sprockets 51 and accordingly the chain 50. The gear ratios are suitably proportioned so that the chain 50 and the chain 39 operate at the same velocity. An operator is stationed opposite the angle bar 64 and places open-ended cellophane or Pliofilm bags with the open end down over the fingers 62. Bags are then carried, as indicated in Figure 2, over the sprockets 53 and inverted. As the bags are inverted they are engaged by the bag holder 73 mounted upon the chain 39 and as they come into alignment with the elongated opening 80*a* in the hopper 80 the bags are filled with the dried fruit. It will be appreciated that the fingers 62 still remain inserted in the bags 70 as the bags are being filled, and the plates 59 serve to close all parts of the elongated opening 80*a* of the hopper except the portion directly over the bags being filled. The fingers 62 in the region opposite the angle bar 64 are converging, which facilitates the placing of the bags 70 thereon. While in the region of the sprockets 53 the fingers 62 assume radial positions and hence are diverging and serve to support and retain the bags 70 during the inverting thereof, however after leaving the sprockets 53, the chains 50*a* and 50*b* engage the rails mounted in the angle bars 100 which are substantially straight and hence the fingers 62 assume a parallel position. As the bags progress from their position underlying the hopper the paths of the chains 39 and 50 diverge, as clearly illustrated in Figure 2, and as the paths of the two chains diverge and the fingers 62 are then in parallel position the fingers 62 are withdrawn from the filled bags which remain in the bag holders 73 as illustrated in Figure 14.

The bags having been filled, they then travel in the bag holders 73 on the chain 39 where they may pass a checking station where operators may weigh each individual bag on the scales 110 in order to assure that each bag is filled with a suitable weight of dried fruit. After being checked the bags may be replaced on the bag holder 73 where they are passed in alignment with a bag sealer 115 for sealing the open end of the filled bags. It will thus be appreciated that by means of this invention the bags are presented to a filling station, filled, checked and sealed in one continuous operation.

While there has been described what has been considered the preferred embodiment of the invention, it will be appreciated by those skilled in the art that various changes and modifications may be made without departing from the essence of the invention, and it is intended to cover herein all such changes and modifications as come within the true spirit and scope of the appended claims.

What is claimed is:

1. A packaging machine comprising an endless chain having a plurality of outstanding fingers thereon adapted to receive and support open bags to be filled, a wheel engaged by said chain and inverting said chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, and a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers.

2. A packaging machine comprising an endless chain having a plurality of outstanding fingers thereon adapted to receive and support open bags to be filled, a wheel engaged by said chain and inverting said chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting

means thereon adapted to successively receive and support said bags, a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers, and a curved portion in the path of said first chain adapted to incline pairs of said outstanding fingers towards each other to facilitate loading of the bags thereon.

3. A packaging machine comprising an endless chain comprising two spaced-apart chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers to receive and support open bags to be filled, a wheel engaged by said chain and inverting said chain to place said bags to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, and a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers.

4. A packaging machine comprising an endless chain comprising two spaced-apart chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers to receive and support open bags to be filled, a wheel engaged by said chain and inverting said chain to place said bags to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers, and a curved portion in the path of said first endless chain adapted to incline pairs of said outstanding fingers towards each other to facilitate loading of the bags thereon.

5. A packaging machine comprising an endless chain comprising two spaced-apart roller chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers thereon adapted to receive and support open bags to be filled, a track for said roller chains disposing said endless chain in a vertical plane, a wheel engaged by said endless chain and inverting said endless chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, and a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers.

6. A packaging machine comprising an endless chain comprising two spaced-apart roller chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers thereon adapted to receive and support open bags to be filled, a track for said roller chains disposing said endless chain in a vertical plane, a wheel engaged by said endless chain and inverting said endless chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers, and a curved portion in the path of said first endless chain adapted to incline pairs of outstanding fingers towards each other to facilitate loading of the bags thereon.

7. A packaging machine comprising an endless chain comprising two spaced-apart roller chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers thereon adapted to receive and support open bags to be filled, a track for said roller chains disposing said endless chain in a vertical plane, a wheel engaged by said endless chain and inverting said endless chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, said bag supporting means comprising a plate secured to said second endless chain, an outstanding side wall and arms projecting from two sides of said side wall, and a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers.

8. A packaging machine comprising an endless chain comprising two spaced-apart roller chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers thereon adapted to receive and support open bags to be filled, a track for said roller chains disposing said endless chain in a vertical plane, a wheel engaged by said endless chain and inverting said endless chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, said bag supporting means comprising a plate secured to said second endless chain, an outstanding side

wall and arms projecting from two sides of said side wall, a hopper for filling said bags positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers, and a curved portion in the path of said first endless chain adapted to incline pairs of outstanding fingers towards each other to facilitate loading of the bags thereon.

9. A packaging machine comprising an endless chain comprising two spaced-apart roller chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers thereon adapted to receive and support open bags to be filled, a track for said roller chains disposing said endless chain in a vertical plane, a wheel engaged by said endless chain and inverting said endless chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, and a hopper for filling said bags having an opening positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers, said plate members being adapted to cover all of said opening in said hopper other than the space between said outstanding fingers.

10. A packaging machine comprising an endless chain comprising two spaced-apart roller chain members and plate members secured thereto, the ends of said plate members being bent upwardly to form outstanding fingers thereon adapted to receive and support open bags to be filled, a track for said roller chains disposing said endless chain in a vertical plane, a wheel engaged by said endless chain and inverting said endless chain to place said bags in position to be filled by gravity, said wheel serving to diverge said fingers radially thereof during inverting of said bags to retain said bags thereon, a second endless chain having bag supporting means thereon adapted to successively receive and support said bags, a hopper for filling said bags having an opening positioned in the path thereof, said first chain after leaving the region of said hopper having a substantially straight path diverging from the path of said second chain whereby said fingers are disposed in parallel relation and the filled bags travelling on said second chain are removed from said fingers, said plate members being adapted to cover all of said opening in said hopper other than the space between said outstanding fingers, and a curved portion in the path of said first endless chain adapted to incline pairs of outstanding fingers towards each other to facilitate loading of the bags thereon.

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