April 2, 1929. G. L. SACHS 1,707,816

PIE CRIMPING MACHINE

Filed Sept. 17, 1925

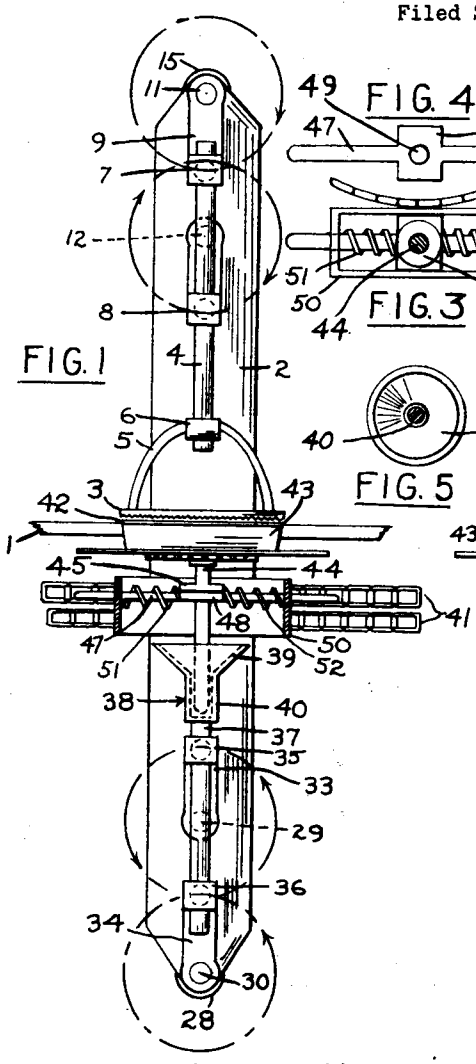


FIG. 1

FIG. 4

FIG. 3

FIG. 5

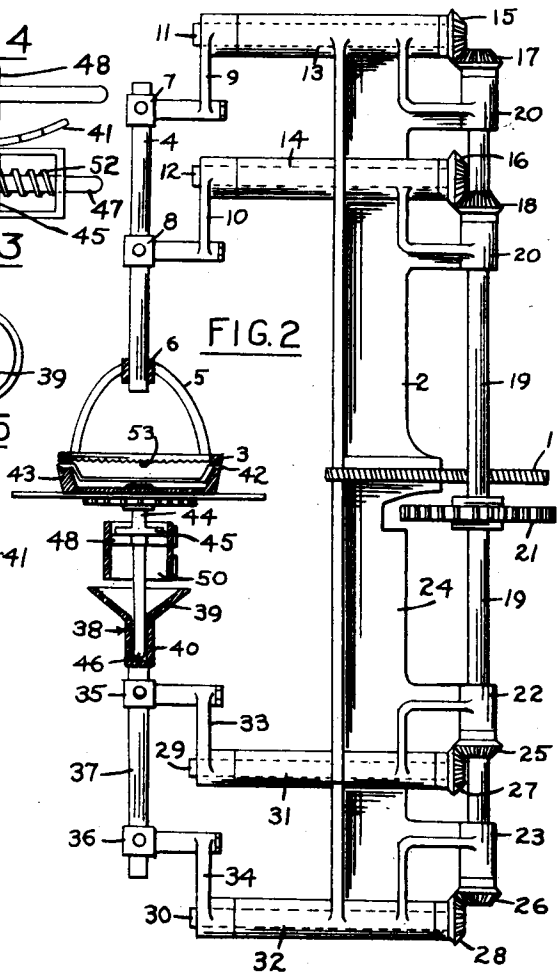


FIG. 2

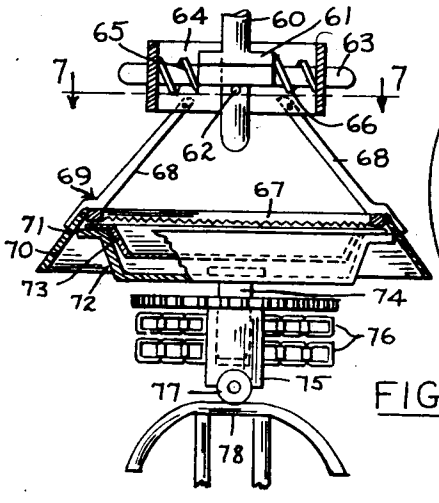


FIG. 6

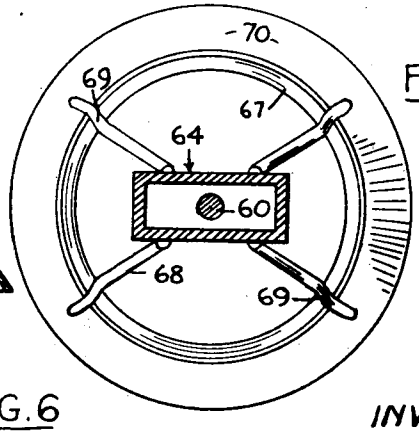


FIG. 7

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UNITED STATES PATENT OFFICE.

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PIE-CRIMPING MACHINE.

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This invention relates to automatic pie machinery, and more particularly to a pie crimping device for use in connection with pie making machines.

In pie machines now in use, wherein the pie is moved continuously and is crimped as it moves along, it is highly necessary that the movement of the crimper be exactly synchronized with the movement of the conveyor in order that the crimping action may take place while the pie is directly under the crimping head. This has heretofore been found extremely difficult to accomplish because of slack in the pie carrying conveyor, the wear in moving parts, and the difficulty of mechanically synchronizing the movements of the crimper head and the pie conveyor which move along different paths.

If the movements of the crimper head and the pie conveyor are not exactly synchronized, the crimping head will descend on a portion of the pie other than the edge. Continued movement of the crimper head and the pie conveyor will result in a tearing of the upper pie crust, with the resultant complete loss of the pie, or the necessity of passing the pie through the machine again to receive a new upper crust.

It is one of the objects of this invention to provide means for accurately crimping the pie and preventing the destruction thereof due to this non-synchronism of movements.

It is also the object of this invention to provide means to center the pie carrier relative to the crimping head.

Another object of this invention is to provide resilient means for relatively centering the pie carrier and the crimping head.

Other objects and advantages will appear from a consideration of the following detailed description and accompanying drawing, in which:

Fig. 1 is a front elevation of the device with the rectangular link shown in section;

Fig. 2 is a side elevation partly in section;

Fig. 3 is a plan view of the rectangular link and associated parts, the conveyor being shown in the position it will take when rounding the end of the machine;

Fig. 4 is a plan view of the pin used in the rectangular link;

Fig. 5 is a plan view of the centering socket;

Fig. 6 is a front elevation partly in section of a modification of the invention; and

Fig. 7 is a horizontal section taken through line 7—7 of Fig. 6.

Referring now to the accompanying drawing, 1 designates a part of the frame of the machine on which is mounted an upright standard 2. The pie crimping head 3 is supported on the vertical rod 4 by means of arms 5 connected at their lower ends by any suitable means to crimping head 3 and at their upper ends rigidly to collar 6 carried by said rod 4. Any other means may be used to connect the crimping head 3 to rod 4.

Rod 4 is carried in upper and lower hubs 7 and 8, pivotally mounted on cranks 9 and 10, respectively. Cranks 9 and 10 are rotated in unison by horizontal shafts 11 and 12 carried in bearings 13 and 14 respectively on the standard 2.

Bevel gears 15 and 16 carried by shafts 11 and 12 mesh with similar bevel gears 17 and 18 on vertical drive shaft 19. Vertical shaft 19 is supported in bearings 20 on standard 2 and is rotated by sprocket wheel 21 which is driven from the main drive of the pie machine (not shown). It will thus be seen that rotation of shaft 19 imparts simultaneous rotation to cranks 9 and 10, which will cause rod 4 to bodily rotate while constantly maintaining its vertical position, and so cause crimping head 3 to rotate in a circular path in a vertical plane, for a purpose which will hereinafter appear.

The shaft 19 is continued downward below the sprocket wheel 21 and is supported in bearings 22 and 23 carried in standard 24. Shaft 19 carries bevel gears 25 and 26 which mesh with similar bevel gears 27 and 28 carried on parallel horizontal shafts 29 and 30 rotating in bearings 31 and 32 on the standard 24. Shafts 29 and 30 carry cranks 33 and 34 respectively, to which are pivotally mounted hubs 35 and 36. Said hubs serve to carry a vertical rod 37. It will thus be seen that rod 37 is given a bodily rotative movement substantially identical with the movement of vertical rod 4.

Rod 37 at its upper end carries a socket member 38, which comprises the inclined annular wall 39 merging at its lower end into a cylindrical well 40 (see Figs. 2 and 5). This socket member 38 is secured to shaft 37 by any suitable means.

Referring now to Fig. 1, 41 designates a part of the conveyor which is used to carry the pie tins and their holders along the pie machine. It will be understood by those skilled in the art that this conveyor carries the pie tins past several stations where vari-

ous operations are carried out, such as, lining the empty tin with the lower crust, inserting the filling, applying the top crust, crimping, trimming, and applying glazing to the top crust. Finally the tin with the completed pie is removed from the machine. Figs. 1 and 2 show the pie tin and its support at the crimping station only, the other stations not being shown as they form no part of this invention.

42 designates the pie tin which is shown as supported in the holder 43 to which is connected supporting shaft 44. Shaft 44 carries rigidly therewith a collar 45 at a suitable distance intermediate its ends. At its lower end, shaft 44 is rounded as at 46 to form a smooth bearing surface, furnishing in effect a ball bearing for engagement with inclined wall 39 for a purpose which will hereinafter appear. Shaft 44 is loosely mounted in pin 47 which has an enlarged central portion 48 having an aperture 49 for the reception of the shaft (see Figs. 3 and 4). It will be seen from Figs. 1 and 2 that collar 45 rests directly on enlarged portion 48 of the pin 47. The opposite ends of pin 47 are journaled in suitable apertures in hollow rectangular link 50 which is fastened to and carried by the links of conveyor 41 in any suitable manner. Coil springs 51 and 52 are mounted on pin 47 and bear against central portion 48 of the pin 47 at their inner ends and against the end walls of link 50 at their outer ends. Thus pin 47 and shaft 44 carried thereby are normally held in a central position with respect to link 50, but due to the sliding and yieldable mounting of the pin 47 in link 50, pin 47 and shaft 44 may be moved horizontally either to the left or to the right as viewed in Fig. 1. This is to allow shaft 44 and holder 43 carried thereby to be moved relative to the conveyor to assure the exact centering of the pie holder relative to the crimping head 3.

It will be seen from Fig. 3 that the enlarged portion 48 of the pin 47 has sliding contact with the side walls of link 50 to steady the shaft 44. This contact, however, is not absolutely essential and may be omitted if desired.

In the operation of the form of the invention shown in Figs. 1 to 5 inclusive, the conveyor 41 serves to carry the pie tins around the machine, these tins being borne by holders 43 and shafts 44, arranged at spaced intervals along the conveyor, only one of said holders and its accompanying shaft being shown in the drawings. The pies are made in the tins 42 as the latter are carried past the various stations in the machine, and finally reach the pie crust crimping station shown in Figs. 1 and 2. The conveyor 41 is continuously moving and the crimping head 3 is continuously moving in a circular path in a clockwise direction as shown by the arrows in Fig. 1. It should be understood that the invention can also be applied to pie machines in which the conveyor moves step by step. The movements of the conveyor and crimping head are so timed that the crimper element approaches, coacts with, and recedes from the pie tin as the latter gradually travels past the standard 2. The crimping head is formed with the usual corrugations 53 which come in contact with the rim of the pie (not shown) to crimp said rim. As is obvious from the above description the crimping head travels in unison with the conveyor during a portion of its movement, and each time that it reaches the lowest point in its travel, acts successively on the pies carried by the conveyor.

Socket member 38 travels in a circular path similar to that traveled by the crimping head but in a counter-clockwise direction (see arrows in Fig. 1). The movement of the socket member is so timed with relation to the movement of the crimping head that it approaches the rounded end 46 of the shaft 44 as the crimping head approaches the pie tin. Socket member 38 travels in unison with the shaft 44 in the same manner as crimping head 3 travels in unison with the pie tin.

If the pie tin is exactly centered with respect to the crimping head, the rounded end of shaft 44 will enter the cylindrical well 40, and thus be steadied during the crimping operation. However, as is often the case, the pie tin is not exactly centered relative to the crimping head for various reasons outlined heretofore. In this case, as the socket member approaches its highest position, the rounded end 46 of shaft 44 will contact with some portion of the inclined annular wall 39 and be forced into the well 40 against the tension of spring 51 or 52 by the continued upward movement of the socket member. Thus the shaft 44 is exactly centered with respect to the crimping head 3 at the instant said crimping head meets the rim of the pie carried in the holder 43. Although Fig. 1 shows the crimper in its lowest position at the same time that socket member 38 is at its highest position, I do not wish to be limited to such a timing as some other timing of the parts may be found more practical.

It should be noted that the end of shaft 44 is received in well 40 before the latter reaches its highest position so that the pie tin holder is maintained centered with respect to the crimping head during all the time that the crimping head is in engagement with the pie crust.

Figs. 6 and 7 show a modification of the invention wherein the crimping head is movably mounted relative to its supporting shaft for centering purposes, while the pie tin support is fixedly mounted on its conveyor.

Shaft 60, corresponding to shaft 4 in Figs. 1 to 5, has rigid therewith a collar 61, and carries a removable pin 62. Mounted on

shaft 60 between collar 61 and pin 62 is pin 63 similar in all respects to pin 47 shown in Figs. 1 to 5. The opposite ends of pin 63 are loosely received in apertures in the end walls of hollow rectangular link 64. Pin 63 and shaft 60 are normally held in a central position with respect to link 64 by coil springs 65 and 66 carried by the pin 63 (Fig. 6).

Crimping head 67 is rigidly supported from link 64 by arms 68 which are rigidly connected at their upper ends to link 64 and at their lower ends to crimping head 67. The lower ends of arms 68 are offset as at 69 and are soldered or otherwise fastened to an inclined annular skirt 70 adapted to contact with extended edge 71 of pie tin holder 72 when said crimping head is in the lower portion of its travel. It will be noticed that in this form of the invention the edge of the pie tin 73 is spaced inwardly from the edge 71 of the holder 72 in order that the skirt 70 in its descent may not disarrange the pie tin from its holder.

Holder 72 is mounted on shaft 74 in any suitable manner and is supported in bearing member 75 carried on conveyor 76. Bearing member 75 at its lower end carries roller 77 which runs on a suitable track 78 for steadying the pie tin holder during the crimping operation.

In the operation of this form of the invention (Figs. 6 and 7), the pie tin 73 and its holder 72 are carried by the continuously moving conveyor 76. Crimping head 67 and skirt 70 are mounted to move in a circular path similar to the path followed by crimping head 3 in Figs. 1 and 2. Thus crimping head 67 and skirt 70 approach, coact with, and recede from the pie (not shown) in its tin 73 as the latter moves past the crimping station. Skirt 70, simultaneously with the crimping operation of the crimping head 67, serves to trim off any surplus dough from the edge of the pie tin by its engagement with edge 71 of the holder 72.

If the movements of the conveyor 76 and shaft 60 are exactly synchronized, the crimping head will act on the rim of the pie while traveling in unison with the latter during the lower portion of travel of said crimping head. But if these movements are not synchronized, the inclined skirt 70 will make sliding contact during its descent with extended edge 71 and cause the crimping head to shift relative to its supporting shaft 60 against the tension of spring 65 or 66 according as the crimping head is off center in one direction or the other.

Thus it will be seen that I have provided positive means for causing the crimping head always to engage the rim of a pie during the crimping operation, so that the pie will not be mutilated or spoiled by engagement of the crimping head with parts of the top crust other than the rim because of inaccuracies in the registration of the movements of the pie conveyor and the crimping head.

I do not wish to be limited to the specific construction shown in the drawings as changes may be made therein without departing from the spirit of the invention. The drawings and description are to be considered as merely illustrative of the invention and not as limiting it, as the scope of the invention is to be ascertained by reference to the appended claims.

I claim:

1. A pie machine comprising in combination, a pie crimper, means for bringing said crimper into operation upon a pie, a continuously-moving conveyor having a straight path of travel adjacent said crimper, a pie tin holder carried by said conveyor, means for mounting said holder on said conveyor for movement in a straight line parallel to the path of travel of said conveyor, and means for moving said holder along said straight line prior to the operation of said crimper to center a pie carried in said holder relatively to said crimper.

2. In a pie machine, the combination of a pie supporting means, a continuously forward-moving conveyor carrying said supporting means, means for crimping the rim of a pie held by said supporting means, and means for centering the pie supporting means with respect to the crimping means prior to the crimping operation and during the continuous forward movement of the conveyor.

3. In a pie making apparatus, the combination of a pie supporting means, a crimping head for operating on the rim of a pie held by said supporting means, means for relatively moving the pie supporting means and the crimping head whereby the pie is crimped around its rim, and means for centering the pie with respect to the crimping head by a straight line movement prior to the engagement of said crimping head with said pie.

4. In a pie making apparatus, the combination of a pie tin holder, means for supporting said holder, a crimping head for operating on the rim of a pie in said pie tin, means for relatively moving said pie tin holder and said crimping head whereby the pie is crimped around its rim, means for mounting said holder in said supporting means for relative horizontal movement thereto, and means for moving the pie tin holder horizontally relative to its support for assuring the centering of said support with respect to the crimping head prior to the engagement of said crimping head with said pie.

5. In a pie machine, the combination with a pie tin holder of a conveyor for moving said holder and to which said holder is connected, a crimper for acting on the rim of a

pie carried in said pie tin, means for relatively moving the crimper and holder to crimp the rim of a pie, and means actuated in synchronism with the aforesaid means for centering the holder with respect to the crimper prior to the engagement of said crimping head with said pie.

6. A pie making machine having in combination, a pie crimper, means for bringing said crimper into operation, a continuously moving conveyor, a pie tin holder carried by said conveyor, and means for relatively centering said pie crimper and pie tin holder prior to the engagement of said crimping head with said pie.

7. In a pie machine, a continuously moving conveyor, a pie tin holder carried by said conveyor, a pie crimping head, means for moving said crimping head in unison with and in proximity to said holder in order to crimp the rim of a pie carried by the holder, and means for relatively centering the pie tin holder and crimping head prior to the contact of said crimping head with said pie.

8. In a pie machine, a pie tin holder, a conveyor for progressing said holder around the machine, a crimping head supported adjacent the path of the conveyor, means for actuating the crimping head to crimp the rim of a pie carried by said holder, and means actuated in synchronism with the crimping head for centering the pie tin holder relatively to the crimping head prior to the contact of said crimping head with said pie.

9. A pie machine comprising a conveyor, a pie tin holder, means for mounting said holder on said conveyor for horizontal movement relative thereto, a crimping head supported adjacent said conveyor, means for moving said head into engagement with a pie on said holder, and means for shifting said holder horizontally with respect to said conveyor for centering said holder relatively to the crimping head.

10. In a pie machine, a pie crust crimping head, a conveyor mounted for movement along a substantially straight path and past the crimping head, a pie holder carried by said conveyor, means for moving said crimping head so that it approaches, moves along with, and recedes from the conveyor for crimping a pie held in said holder, and positive means for relatively centering the crimping head and pie holder prior to the engagement of said crimping head with said pie.

11. In combination, a pie crimping head, a movable pie holder, means for bringing the crimping head into engagement with a pie in said holder, and a continuously moving member having an inclined surface for relatively centering the pie holder and crimping head prior to the engagement of said crimping head with said pie.

12. In a pie machine, a conveyor, a pie holder slidably carried by the conveyor, a crimping head supported adjacent said conveyor, means for moving said head into engagement with a pie in said holder, and means for sliding said holder with respect to said conveyor for centering said holder relatively to the crimping head.

13. The construction of claim 12, wherein the conveyor comprises an endless flexible member and means for continuously moving the same.

14. The construction of claim 12, wherein the means for sliding said holder with respect to said conveyor comprises a movable member having an inclined wall, and means for moving the same.

15. In a pie machine, the combination of a conveyor, an aperture link carried by the conveyor, a pie tin holder having a supporting shaft, means for slidably mounting said shaft in the aperture of said link, a crimping head supported adjacent said conveyor, means for bringing said head into engagement with a pie in said holder, and means for sliding said shaft in said link for centering said shaft and its pie tin holder with respect to the crimping head.

16. The construction of claim 15, wherein the means for slidably mounting said shaft comprises a pin loosely mounted in opposite walls of said link, means for supporting said shaft on said pin, and a pair of springs acting on opposite sides of said shaft for normally holding said shaft centered with respect to the aperture, but yieldable to permit said shaft to be moved with respect to said link.

17. In a pie machine, the combination of a conveyor, an apertured link carried by the conveyor, a pie tin holder having a depending supporting shaft passing through the aperture in said link, a pin loosely mounted in opposite walls of said link, means for supporting said shaft on said pin, a pair of springs located on opposite sides of said shaft and engaging opposite walls of said link for normally holding said shaft centered with respect to said link but yieldable to allow said shaft to be moved with respect to said link, a crimping head supported adjacent said conveyor, means for bringing said crimping head into engagement with a pie on said pie tin holder, means for sliding said shaft and its pie tin holder with respect to said link for relatively centering the holder and said crimping head, said last mentioned means comprising a socket member having an inclined wall adapted to engage the lower end of said shaft, and means actuated in synchronism with said crimping head operating means for moving said socket member into engagement with the end of said shaft.

18. In a pie machine, in combination, a continuously moving conveyor, a pie tin holder carried by said conveyor, a pie crimping head, means for moving said crimping head in uni-

son with and in proximity to said holder in order to crimp the rim of a pie carried by said holder, and means acting on said holder to center the same with respect to said crimping head prior to contact of said head with the pie in said holder and to maintain said holder centered so long as said head is in contact with said pie.

19. In a pie machine, a conveyor, a pie tin holder, means for mounting said holder on said conveyor for movement relative thereto, a crimping head supported adjacent said conveyor, means for moving said head so that it can engage a pie on said holder for crimping the rim of said pie, and means for moving said holder with respect to said conveyor prior to engagement of said head with said pie for centering said holder with respect to said head.

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