

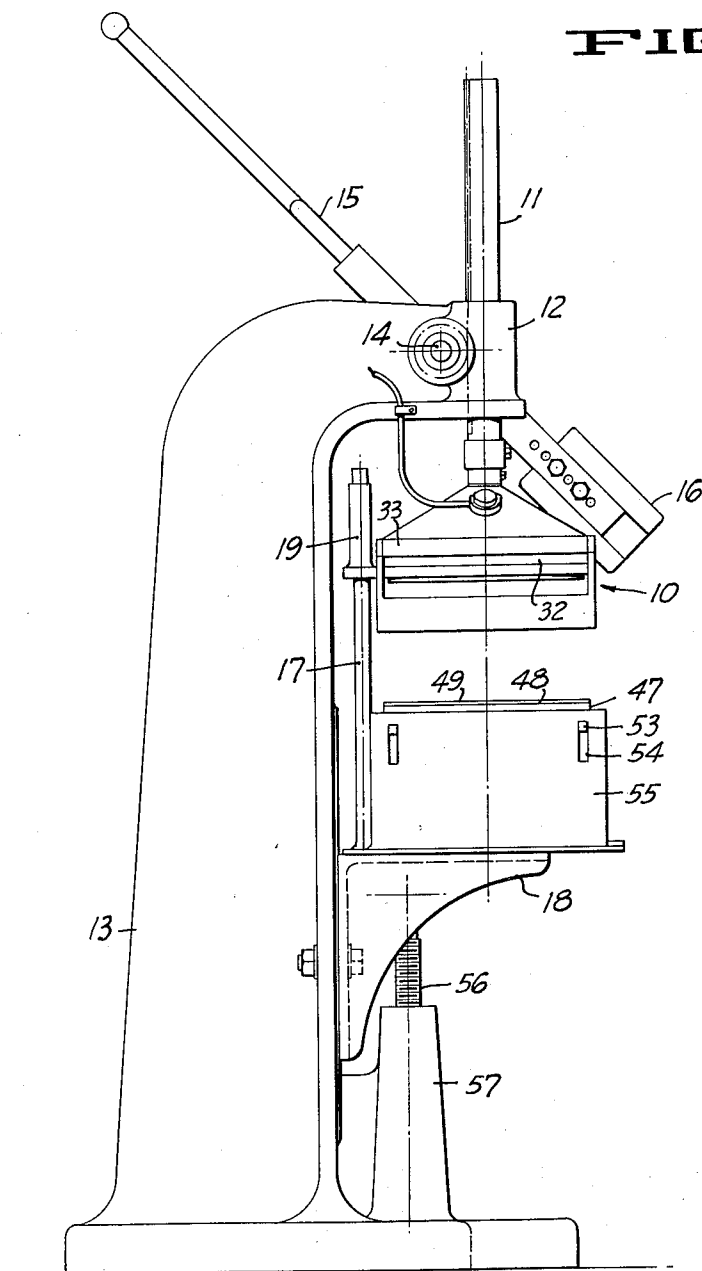
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PIE PACKAGING MACHINE

Filed April 12, 1954

5 Sheets-Sheet 1

FIG. 1.



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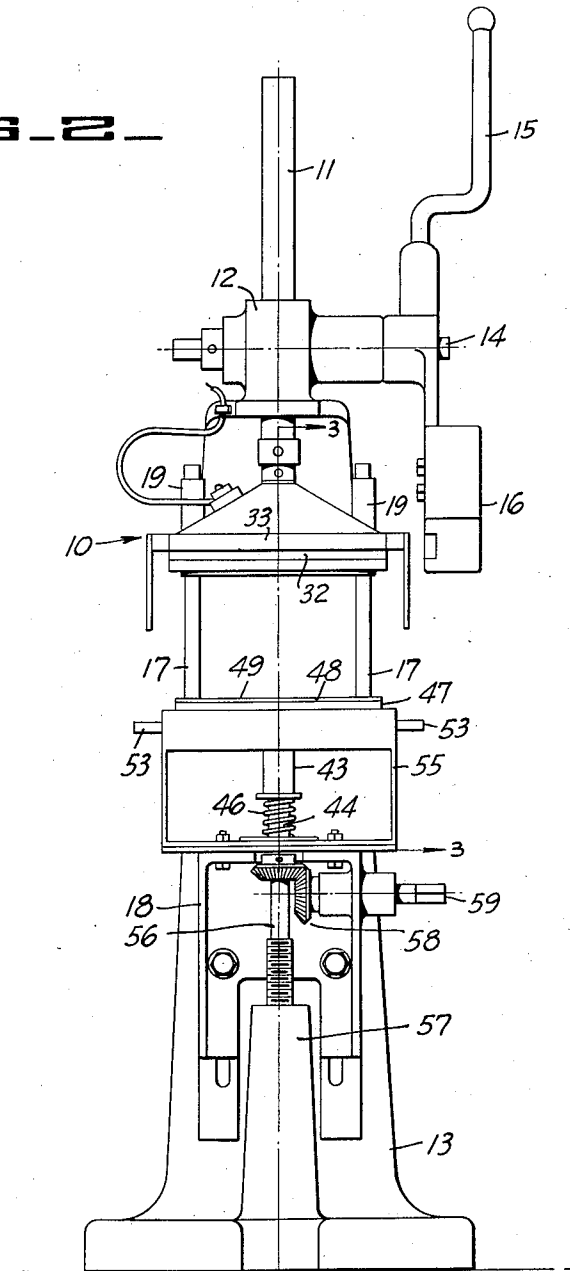
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FIG. 2-



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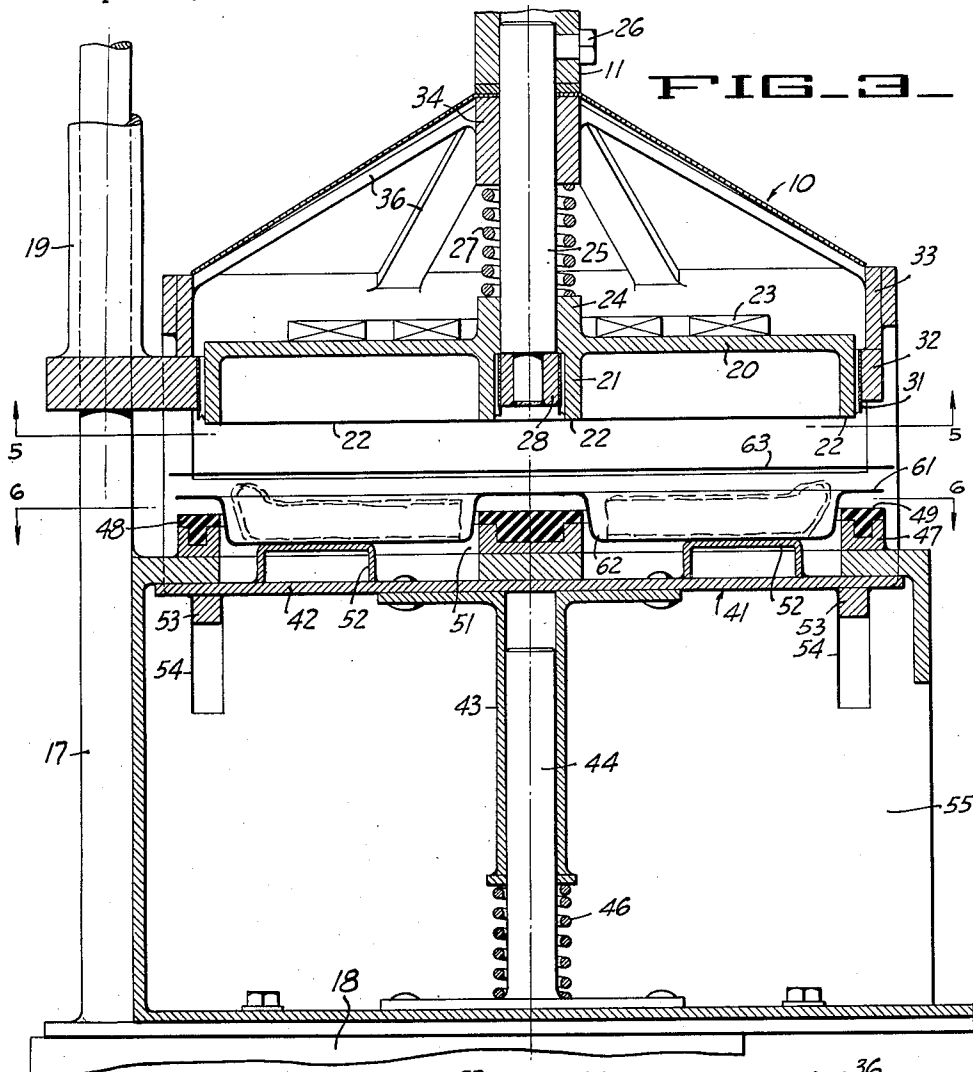
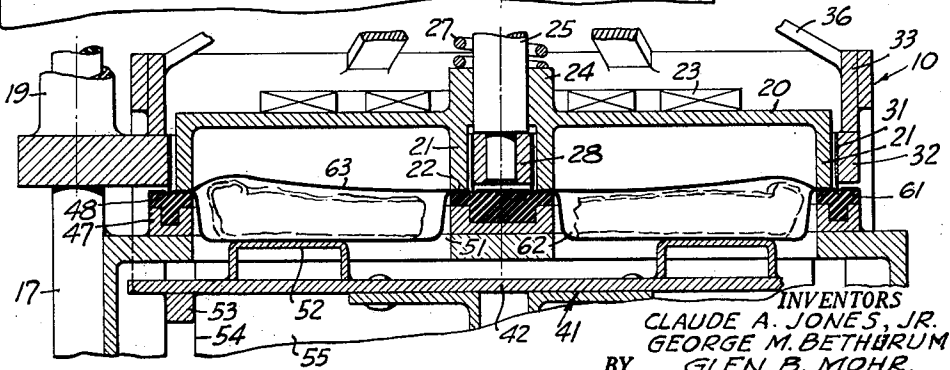
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FIG. 5

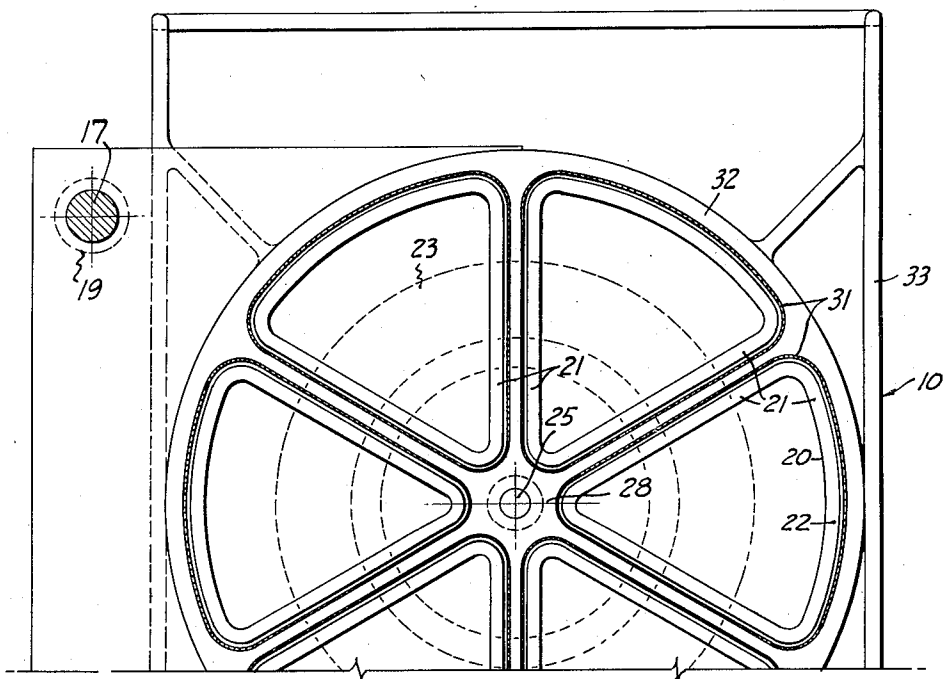
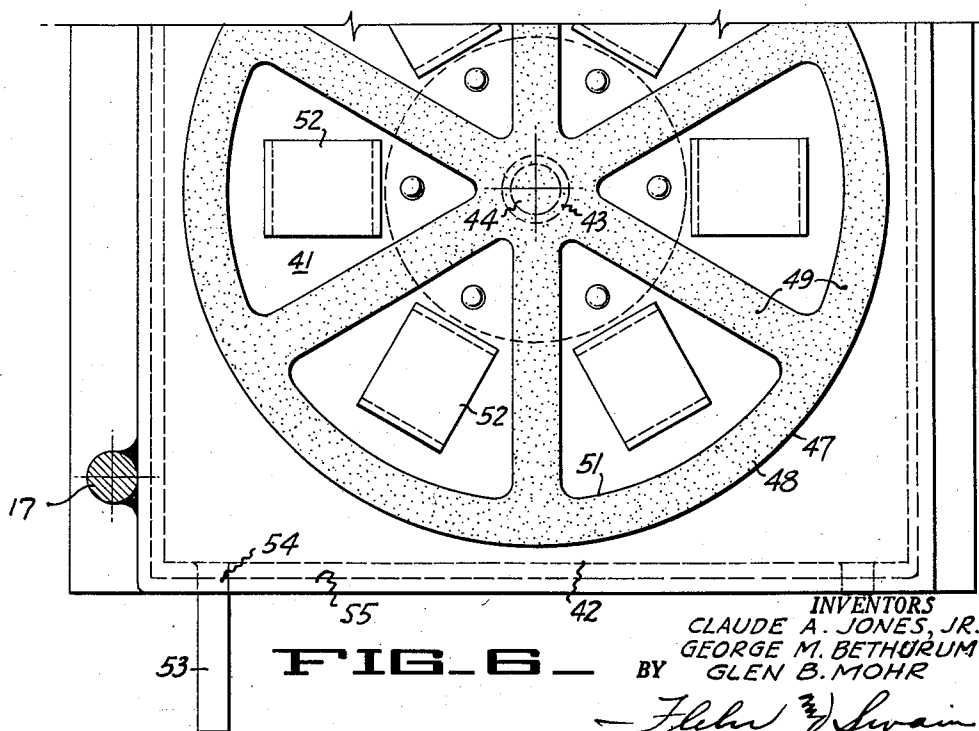


FIG. 6

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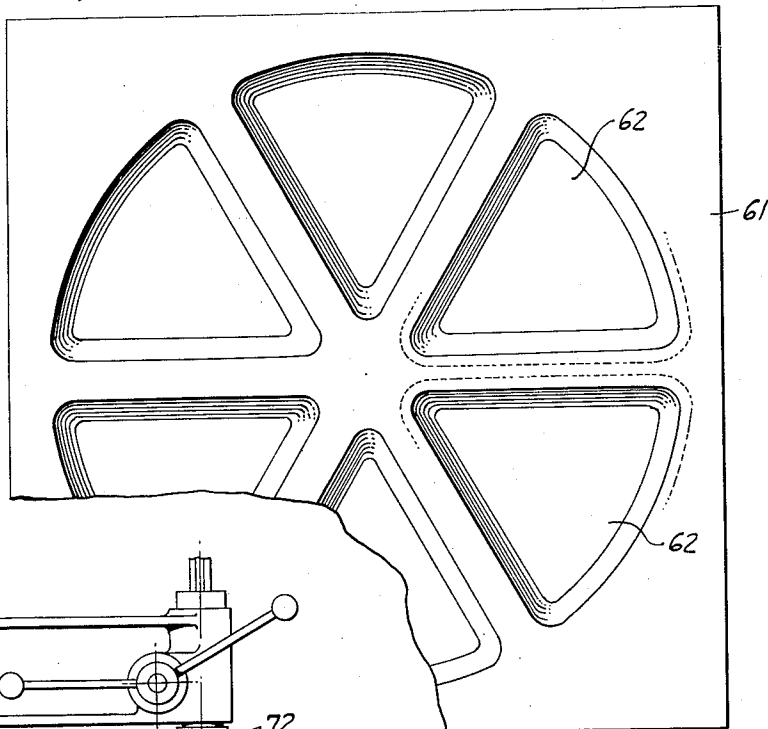


FIG. 7-

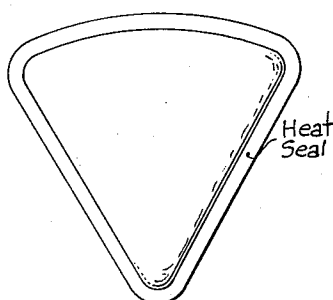


FIG. 8-

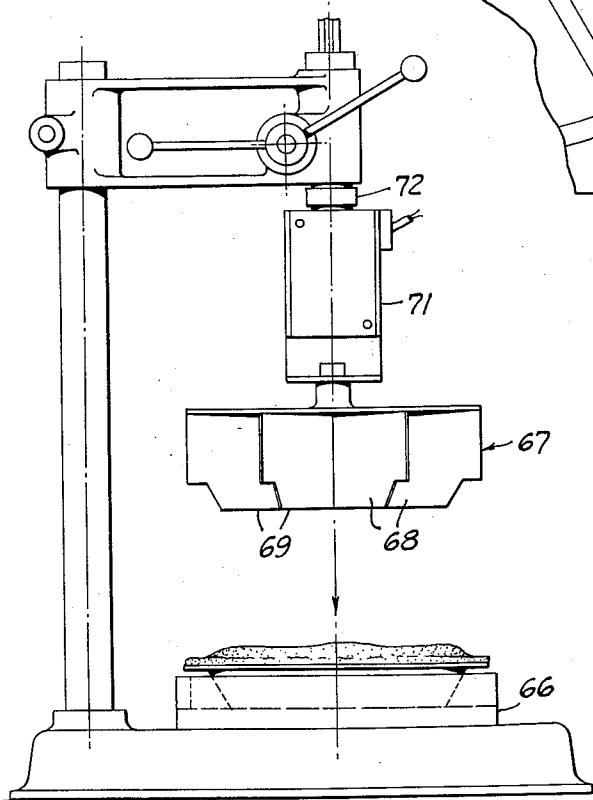


FIG. 9-

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PIE PACKAGING MACHINE

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Application April 12, 1954, Serial No. 422,552

4 Claims. (Cl. 53—372)

This invention relates generally to machines and methods for packaging cut segments of pie.

In the sale of pieces of pie at lunch counters, cafeterias, and like establishments, it is desirable to provide a sanitary protective covering. Wrappings of wax or glassine paper afford some protection, but because of their translucent character they interfere with a clear view of the pie such as is desirable for identification. Furthermore such wrapping materials do not provide any support for the pie, and therefore they are not helpful in the marketing of relatively soft pies of the type having fruit or custard filler.

In general it is an object of the present invention to provide a novel machine and method for the packaging of cut pies or pie segments, which will permit substantially unobstructed inspection, and which in addition will provide some support whereby the package can be handled without difficulty and provides a convenient substitute for a pan or dish when the pie is eaten.

Another object of the invention is to provide a novel product formed of plastic material which can be used to facilitate forming a complete package for pies.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment has been shown in detail in conjunction with the accompanying drawing.

Referring to the drawing:

Figure 1 is a side elevational view illustrating a machine incorporating the present invention.

Figure 2 is a front view of the machine shown in Figure 1.

Figure 3 is an enlarged detail illustrating the principal working parts of our machine, and indicating its mode of operation.

Figure 4 is a view like Figure 3 but showing the parts in sealing and cutting position.

Figure 5 is a cross-sectional view taken along the line 5—5 of Figure 3.

Figure 6 is a cross-sectional view taken along the line 6—6 of Figure 3.

Figure 7 shows the plastic form used to make the package.

Figure 8 shows a completely packaged piece of pie.

Figure 9 illustrates a suitable method for cutting the pies.

The machine illustrated in the drawing consists of an operating head 10 carried by the vertical rod 11, and which can be raised or lowered by suitable operating means. Thus the rod 11 is shown extending through the fixed head stock 12 of the machine frame 13, and is raised or lowered by the turning of a shaft 14 through means such as a rack and pinion (not shown). The shaft 14 is provided with the operating lever 15 and suitable counterbalancing means 16.

The operating head is also guided for vertical movement by the guide rods 17 (Figure 3), which are carried by the frame bracket 18, and which are slidably engaged

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by the sleeves 19. The sleeves in turn are secured to the main body of the operating head.

The operating head 10 incorporates heat sealing and cutting means, which are arranged to be operated sequentially when the head is lowered to operating position. As shown in Figure 3 the heat sealing means consists of a body 20 formed of suitable material such as a metal casting, and which is provided with several sets of depending ribs 21. Each set of ribs provides a lower heat sealing surface 22, which is segmentally shaped, or in other words is shaped similar to the segment of a pie. Suitable electrical heat elements 23 are mounted upon the body 20 and serve to maintain the surfaces 22 at a suitable elevated temperature.

The central part of the heater body 20 is provided with a hub 24 which slidably engages the vertical rod 25. The rod in turn is secured in the lower end of the head rod 11, by suitable means such as a set screw 26. A compression spring 27 yieldably urges the hub 24 against a stop collar 28 at the lower end of the rod 25.

The head also includes cutting means formed by a plurality of cutters 31. Each cutter is shaped segmentally, and surrounds a corresponding rib 21. The cutters are all attached to a spider 32, having its inner portion formed by the stop collar 28, and its outer periphery attached to the rim 33. The rim 33 is attached to rod 25 by hub 34 and the radially extending arms 36. The lower heating surfaces 22 of the heating means are normally in a plane below the lower edges of the cutters 31. The cutting edges of these cutters may be serrated.

Below the operating head there is a work table designated generally at 41, which includes a support plate 42 carried by the vertical pipe or tube 43. Tube 43 slidably engages the vertical rod 44, and the latter is carried by the frame bracket 18. Normally the weight of the working table 41 is carried by the compression spring 46.

The plate 42 underlies a spider 47 formed of suitable material such as cast metal, and which is provided with a top layer 48 of suitable resilient material, such as synthetic rubber. The top surface 49 of the rubber layer 48 forms a cutting surface and extends over a pattern such as shown in Figure 6. The segmental shaped openings 51 are formed by the spider 47, and are adapted to accommodate the pieces of pie to be wrapped. Within the region of each opening 51, the supporting plate 42 is provided with a projecting pie supporting pad 52.

As is evident from a comparison of Figures 3 and 4, the supporting plate 42 is movable against the urge of spring 46 and relative to the spider 47 during operation of the machine. Bars 53 are attached to the plate 42, and the ends of these bars provide studs which are guided in the vertical slots 54. The latter are formed in the plates 55, which extend between the bracket 18 and the spider 47.

It is desirable for the machine supporting bracket 18 to be adjustable in a vertical direction. Thus as shown in Figure 2 it is supported by a rotatable threaded rod 56, which engages a nut (not shown) in the base 57, and which is rotated through the miter gears 58, by turning the shaft 59.

Members 60 are carried by the head and serve to depress bars 53 and plate 42 to the position shown in Figure 4 when the head is fully lowered.

Figure 7 shows the main part of the plastic package as introduced into the machine. The part 61 is formed of suitable sheet plastic material, preferably transparent in character, and which when softened by heating can be readily pressed to a desired form. A suitable material of this character is cellulose acetate. A sheet of

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such material of proper thickness, as for example having a thickness of about .006 inch, is pressed between heated dies to form a cluster of spaced cavities 62 that are each segmental shaped. As viewed in plan these cavities are dimensioned to receive a standard cut of pie, and they have sufficient depth to accommodate a pie of the depth which one desires to package. The remaining part of the package is formed by a flat cover sheet which can be formed of suitable material such as moistureproof cellophane, but which is relatively thin and flexible.

In the operation of our machine, and in carrying out the present method, one first forms a plurality of plastic bodies as shown in Figure 7, with the bodies dimensioned whereby they can be placed within the working table 41 in the manner shown in Figure 3. The pieces of pie can be placed in the cavities before or after part 61 is so positioned. The pie is cut by suitable means which provides segments of the desired size. A sheet 63 of similar plastic material, but which may be considerably thinner, is now laid over the lower part 61, and handle 15 swung to lower the head of the machine. As the head is lowered the heat sealing surface 22 first contacts the sheet 63 and then presses this sheet against part 61, over areas between and surrounding each pocket. Assuming that the surfaces 22 are heated to a proper temperature, this causes a partial melting or fusion of the plastic materials, thus causing them to be heat sealed or welded together. Movement of the lever 15 is continued whereby during such heat sealing contact, the cutters 31 are pressed downwardly against the plastic material thereby carrying out a cutting operation against the resilient surface 49 to cut away the material about each heat seal. Lever 15 is now operated to raise the working head 10 and thereafter the individual packages can be removed from the machine. Each wrapped segment will appear as shown in Figure 8.

Figure 9 shows a suitable method and device for cutting pies. The device consists of a supporting table 66 and a vertically movable cutter 67. The cutter has radially extending blades 68 and cutting edges 69. It is attached to a vibrator 71 of the electrical type, which in turn is carried by the vertically movable rod 72 of a press. A pie with the usual pie pan is placed on the table and the cutter lowered with the vibrator in operation. Due to the vibrating action the cutting blades pass through the pie without crushing, to provide pieces of the desired size.

It will be evident that the machine and method described above makes possible the sanitary packaging of cut pie, and that the individual packages thereby provided are self supporting and can be handled without difficulty. At the time the pie is sold it is a simple matter to strip away the top surfacing, thus permitting the pie to be eaten, using the lower part of the package as a plate or dish. Assuming the use of a transparent plastic sheet material to construct the package, the contents are clearly visible to permit definite identification by inspection, and to enhance attractiveness when the package is displayed on lunch counters, cafeteria shelves and the like.

We claim:

1. In a machine for the packaging of cut pieces of pie, wherein the cut pieces of pie are placed in a sheet of plastic material provided with self-supporting segmental shaped indentations to receive the pie, a work table adapted to support the indented sheet of plastic material with the cut pieces of pie therein, a working head overlying the table, said working head being movable in a vertical direction toward and away from the table, said working head including heat sealing means adapted to form a heat seal between a covering sheet overlying the indented sheet of plastic material and the areas of the plastic material surrounding each of the indented cavities, said head also including cutting means for simultaneously severing the covering sheet and the sheet of plastic material along lines surrounding each

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cavity, thereby providing individual packages for the individual pieces of pie.

2. In a machine for packaging cut pieces of pie wherein the pieces of pie are placed in cavities formed in a sheet of self-supporting plastic material by indentation of the same, a work table adapted to support the indented sheet of plastic material with the pieces of pie therein, heat sealing means providing a plurality of heat sealing surfaces contoured to contact the sheet of plastic material in areas surrounding each indentation, cutting means comprising a plurality of cutters each adapted to cut through the plastic material along lines surrounding each indentation, means mounting the cutter for movement in a vertical direction toward and away from the upper side of the work table, and means forming an operating connection between said heat sealing means and said cutting means, said connection providing limited lost motion in a vertical direction between said means, said heat sealing means contacting the upper surface of the sheet of plastic material when the cutting means is lowered toward the working table, prior to operation of the cutting means.

3. In a machine for packaging articles of food where the articles are disposed in cavities formed in a self-supporting sheet of plastic material, the sheet having flat areas surrounding the cavities, a plate adapted to support the sheet with articles of food in the cavities, means for supporting the plate for movement in a vertical direction, stop means for limiting upward movement of the plate, yieldable means for urging the plate upwardly against such stop means, means forming a substantially flat cutting surface underlying said flat areas of the sheet and adapted to contact said areas when the sheet and said plate are moved downwardly, a vertically movable heat sealer overlying the plate and forming a part of a working head, said sealer having a sealing surface conforming to the configuration of said areas, said sealer being adapted to engage a second cover sheet placed over the first sheet and to move both sheets downwardly by force applied onto to said areas to thereby apply sealing pressure to heat seal the sheets together along said areas, and a vertically movable cutter forming a part of the working head, said cutter being movable to sever the first sheet along lines surrounding each indentation and within said areas, said heat sealer being formed to contact the second sheet only along the region of said areas during said heat sealing operation.

4. In a machine for packaging articles of food where the articles are disposed in sector shaped cavities formed in a self-supporting sheet of plastic material, the sheet having flat areas surrounding the cavities, a plate adapted to support the sheet with articles of food in the several cavities, means for supporting the plate for movement in a vertical direction, stop means for limiting upward movement of the plate, yieldable means for urging the plate upwardly against such stop means, means forming a fixed substantially flat surface disposed to underlie said flat areas of the sheet and adapted to contact the lower side of said areas when the sheet together with said plate are moved downwardly, a vertically movable heat sealing device overlying the plate and forming a part of a working head, said sealing device comprising a plurality of sector shaped portions grouped about a vertical axis, the lower faces of said sectors presenting sealing surfaces overlying and conforming generally to the configuration of the areas of said sheet, said sections being adapted to engage a second cover sheet overlying the first sheet to thereby press the second sheet against said areas of the first sheet to form a heat seal, a hub serving to mount said sections, a vertically movable shaft coincident with said vertical axis, said hub being slidably carried by said shaft, a plurality of sector shaped cutters adapted to embrace the heater portions, means serving to attach the inner adjacent ends of said cutters to said shaft,

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means for attaching the outer portions of said cutters to said shaft, and spring means serving to yieldably urge the heat sealer downwardly relative to the cutters whereby when the shaft is moved downwardly the heat sealing portions are brought into sealing engagement with said sheets and thereafter said cutters caused to sever both sheets along said areas.

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