Nov. 20, 1962 B. FINKLE 3,064,279

PILLOW CONSTRUCTION

Filed Sept. 27, 1960 2 Sheets-Sheet 1

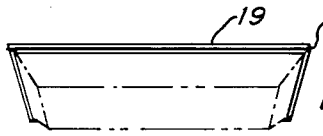

Fig-1

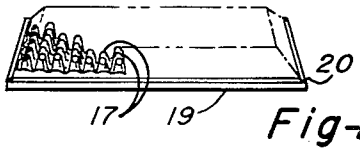

Fig-2

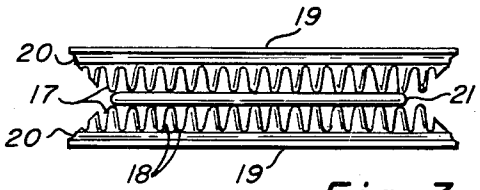

Fig-3

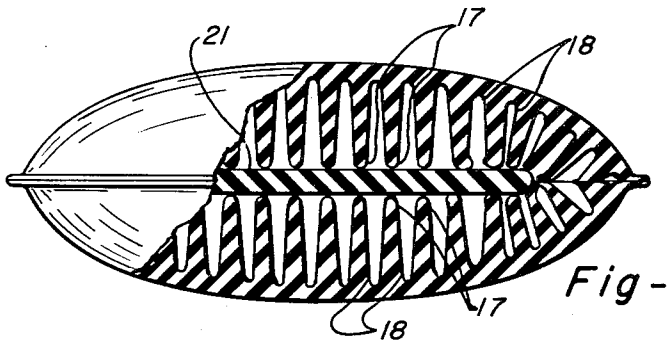

Fig-4

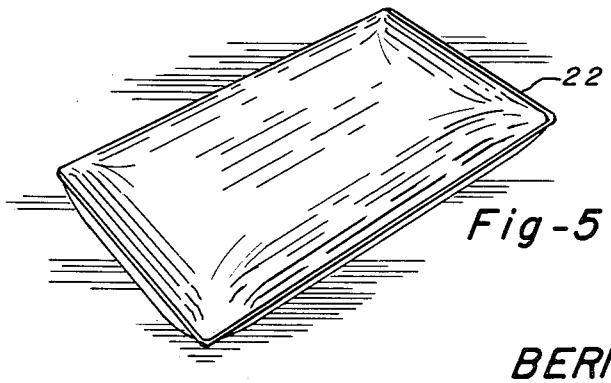

Fig-5

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PILLOW CONSTRUCTION

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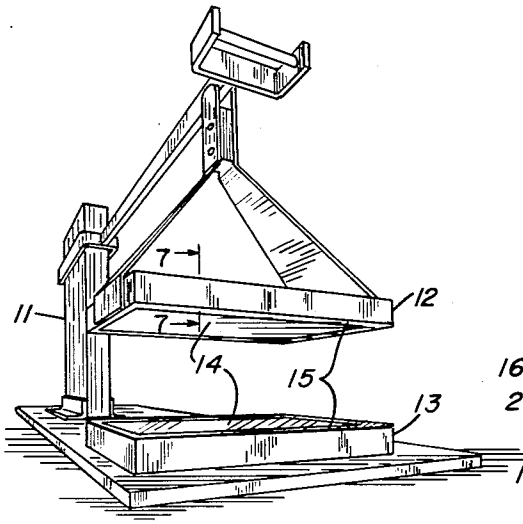

Fig-6

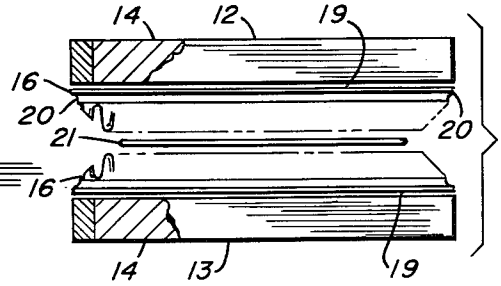

Fig-8

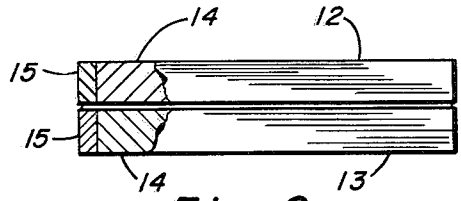

Fig-9

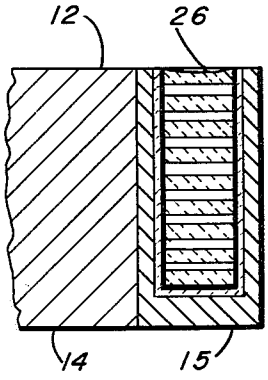

Fig-7

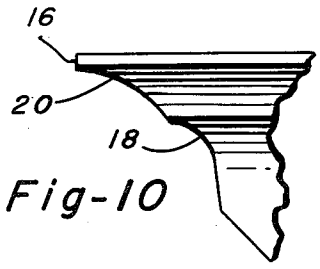

Fig-10

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United States Patent Office 3,064,279 Patented Nov. 20, 1962

3,064,279

PILLOW CONSTRUCTION

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Filed Sept. 27, 1960, Ser. No. 58,694
4 Claims. (Cl. 5—337)

My invention relates generally to foam type or expanded plastic pillows and particularly, pillows having a resistance to complete crushing. This application is copending with applicant's U.S. patent application Ser. No. 58,683, filed in the United States Patent Office on September 27, 1960 for a Method for Making Compressible Expanded Plastic Pillows.

It is among the objects of my invention to provide a pillow construction in which relatively thick foamed plastic resilient sheets are united together.

It is a further object of my invention to provide a foamed plastic pillow which is resistant to complete crushing.

It is yet another object of my invention to provide a light weight foamed plastic pillow with marginally joined sheets of plastic with upstanding fingers on the sheets engaging an intervening sheet.

These objects and advantages as well as other objects and advantages may be achieved by the pillow illustrated in the drawings in which:

FIGURE 1 is a view in perspective of a top sheet for a pillow with the general configuration shown in phantom;

FIGURE 2 is a view in perspective of a bottom sheet for a pillow with the general configuration shown in phantom;

FIGURE 3 is a view in perspective of superposed top, center and bottom sheets for a pillow;

FIGURE 4 is a partially sectioned side view of a pillow composed of the three sheets shown in FIGURE 3 after the top and bottom sheets are united along their marginal edges;

FIGURE 5 is a view in perspective of such a pillow;

FIGURE 6 is a view in perspective of a press for heat-sealing the marginal edges of the top and bottom sheets of a pillow;

FIGURE 7 is a partial vertical sectional view of the sealing die showing the heater construction;

FIGURE 8 is a perspective view of the sheets arranged between the heat-sealing dies prior to sealing;

FIGURE 9 is a side view of the heat-sealing dies with the sheets compressed between them for sealing; and

FIGURE 10 is an enlarged view of a sheet of expanded plastic showing the undercut edges.

Feather down pillows in common use soon lose their resiliency or "tone" and become flat, flabby, unresilient slabs which are uncomfortable to sleep upon. The advent of foam rubber suggested the use of foam rubber biscuits as pillow stuffers. The material however was too readily compressible and hot to sleep on. The advent of flexible foamed plastic material such as polyurethane foam suggested the use of a biscuit of that material as a pillow stuffer. It was found that if two sheets of flexible foamed polyurethane were formed with opposing "egg-carton" configuration faces, and they were marginally united with a sheet of similar material between them, a pillow of just the right texture, or compressibility was formed: light, compressible, yet resilient, and resistant to complete flattening under the weight of the head of the sleeper. The pillow was not hot. The difficulty of sealing the sheets at their marginal edges was discovered to be overcome by undercutting the edges of the sheets, so that a thin, neat bead or edge was formed on the finished pillow.

In referring to the egg-carton configuration, reference is had to the type of carton in which individual depressions

are formed between upstanding fingers for the nesting of the lower half of an egg, and a like configuration on a cover completes the enclosure, with fingers in between to laterally hold the eggs.

Referring now to the drawings in detail, a heat-sealing press **11** is utilized as shown in FIGURE 6. There is a top die **12** and a bottom die **13**. The top and bottom dies **12, 13** have a large central area **14** formed of material having a low coefficient of thermal conduction. Wood or wood compositions may be used. The marginal edges of these top and bottom dies are provided with a metal channel **15** carrying a heating unit **26** of any of numerous well known designs. The dies **12, 13** may be brought together as shown in FIGURE 9, since the upper die **12** may be lowered to meet the bottom die **13**; foam plastic sheets will be compressed between the dies **12, 13** with the marginal edges of the sheets engaged between the heated metal borders **15, 15**. The edges of the sheets will be melted and fused together forming a bead. It will be noted that heat and pressure are applied to the marginal edges of top and bottom sheets, only at the points where they are undercut so that very thin edge-portions of the sheets are united.

The material preferred for the pillow is the expanded flexible plastic polyurethane foam. This foam is utilized in sheets **16** approximately three inches thick. In the interest of lightness of weight and economy of material, instead of plain flat sheets, sheets may be used which have an "egg-carton" configuration. The "egg-carton" configuration is characterized by a plurality of upstanding fingers **17** separated from each other by generally equal corresponding indentations **18**, so that the fingers **17** of opposed sheets **16** will nest in the indentations of the other sheet **16**. The base portion **19** of the sheet from which the fingers **17** rise should be undercut to provide a thin edge **20**. This is necessary because sheets of polyurethane foam in thickness of over one inch are nearly impossible to seal together satisfactorily. Since the base portion **19** of the sheets **16** must the thicker than one inch in order that the pillow have the proper body, the edge-sealing problem is overcome by reducing thickness by undercutting marginal portions of the edges **20** as will appear in FIGURES 1, 2, 3, and 8. The hot wire method of cutting or carving foamed plastic sheets is well known. A generally semicircular edge **20** or channel is cut from each of the sheets by a suitably curved Nichrome wire electrically heated. The edges **20** of reduced thickness are easily united by heat and pressure. The foam biscuits to be united may be approximately 19" x 26" and each 2¾" thick. The semicircular cut out edge **20** or channel should be approximately 2¼" deep so that it will leave ½" as the base portion **19** of each sheet. Thus the marginal edges **20** to be bonded together will, together, be no more than 1" thick, which is within the realm of bonding with ease; a thin bead or edge is formed which is lacking in rigidity.

If the sheets **16** were united with their fingers **17** unopposed, compression would result in an interlace of fingers **17**, which would enter the adjacent corresponding depressions **18**. The result would be that the head of the user would cause great flattening of the pillow. This is avoided by interposing a central sheet **21** of material between the top and bottom sheets before they are sealed together. It is preferred, although not absolutely necessary, that this sheet **21** shall also be of the same material as the top and bottom sheets **16**. The interposition of this central sheet **21** prevents the finger interlace previously referred to and prevents the flattening of the pillow by the weight of the head of the user. It is preferred that this sheet **21** have an area less than the area of the top and bottom sheets **16** so that it will not interfere with the bonding or sealing of the edges of the top and bottom

sheets **16**. Thus such a sheet **21** may be 15" x 22" i.e. disposed inwardly 2" on all four sides from the edges of the top and bottom sheets **16**.

I have referred to heat sealing of the marginal edges of the top and bottom sheets **16**. It is of course possible to apply this heat in numerous manners such as high frequency heat, gas flame, and it is even possible to bond the sheets together with glues or cements and then to apply pressure without heat.

The top and bottom sheets **16** are arranged over each other with the plain central sheet **20** in between them. They are placed in the press and compressed between the dies **12**, **13**. The edges of the dies are hot and are arranged and dimensioned to engage between them the marginal ½" thick (two together, 1") edges of the top and bottom sheets. The heat tends to soften and to melt the foamed plastic, collapse the cellular structure, and cause the sheets to fuse or bond together in a homogeneous bead; when this has occurred, the heat is lowered, and after a dwell time sufficient to allow the fused, bonded margins to set, the pressure is removed and a pillow **22** appears in the shape shown in FIGURE 5 with an internal configuration in accordance with the cross section shown in FIGURE 4.

The bonding temperature for the edges can vary widely, but it has been found that raising the border **15** temperature to 360–420° F. will accomplish a suitable bond, without scorching, in a short time. The exact time can easily be experimentally determined after a few trials. The exact time is dependent upon numerous factors such as material, size of heating coil, size of metal housing, current characteristics, thickness of metal housing of heating coil, dimensions of metal heating margins on the dies, etc.

The foregoing specification is intended merely to be illustrative of the invention for many changes may be made in the selection, construction and arrangement of the parts without departing from the spirit of the invention.

What is claimed:

1. A pillow construction comprising a pair of outer flexible expanded plastic sheets having undercut edges of lesser thickness than the central portion of the sheets, a center sheet of lesser cross-sectional area than the pair of outer sheets and interposed between them, the pair of outer sheets marginally united together, a plurality of fingers on the opposed inner faces of the pair of sheets engaged with the center sheet.

2. A pillow construction comprising a top outer sheet, a plurality of fingers extending outwardly from the top sheet and defining between each other spaces to receive corresponding fingers on another opposed sheet, a bottom outer sheet, a plurality of fingers extending outwardly from the bottom sheet and defining between each other spaces to receive corresponding fingers on another opposed sheet, the top and bottom sheets arranged with their respective fingers in general opposition, a center inner sheet disposed between the top and bottom sheets and engaged on both sides of a plurality of the fingers on the top and bottom outer sheets, the top and bottom sheets having marginal edges of lesser thickness than the central portion of the sheets, the thinner marginal edges united together.

3. A pillow construction comprising a top outer sheet, a plurality of fingers extending outwardly from the top sheet and defining between each other spaces to receive corresponding fingers on another opposed sheet, a bottom outer sheet, a plurality of fingers extending outwardly from the bottom sheet and defining between each other spaces to receive corresponding fingers on another opposed sheet, the top and bottom sheets arranged with their respective fingers in general opposition, a center inner sheet disposed between the top and bottom sheets and engaged on both sides by a plurality of the fingers on the top and bottom outer sheets, the top and bottom sheets having marginal edges of lesser thickness than the central portion of the sheets, the thinner marginal edges united together, the top and bottom sheets being formed of a flexible expanded plastic material.

4. A pillow construction comprising a top outer sheet, a plurality of fingers extending outwardly from the top sheet and defining between each other spaces to receive corresponding fingers on another opposed sheet, a bottom outer sheet, a plurality of fingers extending outwardly from the bottom sheet and defining between each other spaces to receive corresponding fingers on another opposed sheet, the top and bottom sheets arranged with their respective fingers in general opposition, a center inner sheet disposed between the top and bottom sheets and engaged on both sides by a plurality of the fingers on the top and bottom outer sheets, the top and bottom sheets having marginal edges of lesser thickness than the central portion of the sheets, the thinner marginal edges united together, the top and bottom sheets being formed of flexible polyurethane foam.

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