May 17, 1966 N. H. SALTNESS ETAL 3,251,075

INFLATABLE PILLOW

Filed June 27, 1962 2 Sheets-Sheet 1

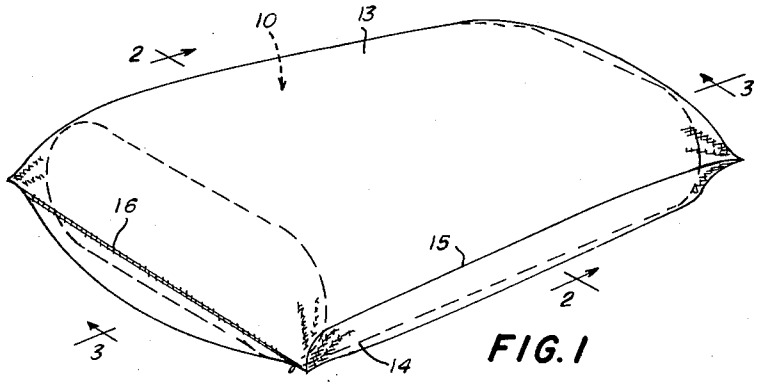


FIG. 1

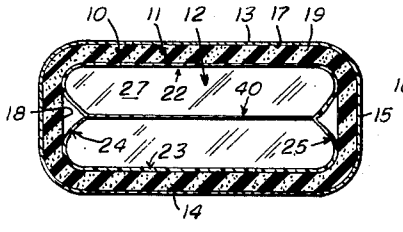


FIG. 2

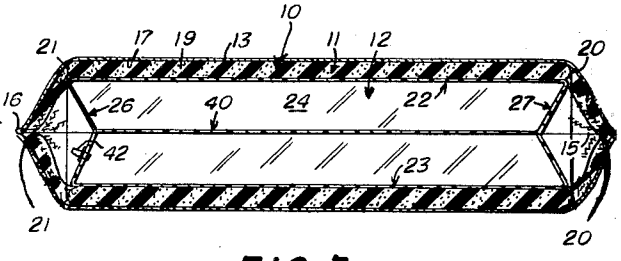


FIG. 3

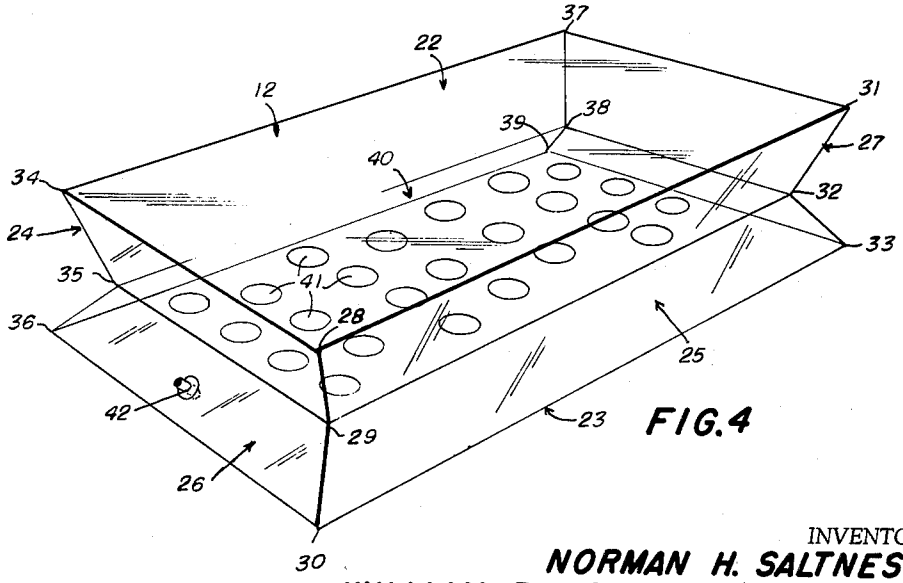


FIG. 4

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INFLATABLE PILLOW

Filed June 27, 1962 2 Sheets-Sheet 2

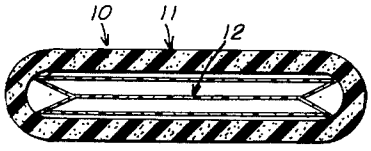


FIG. 5

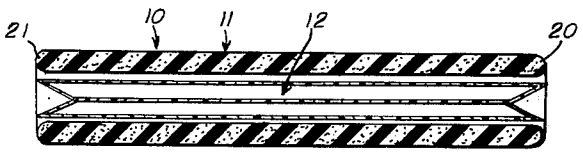


FIG. 6

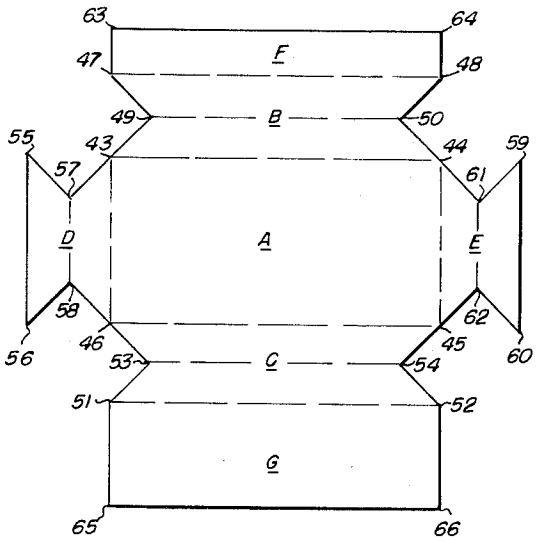


FIG. 7

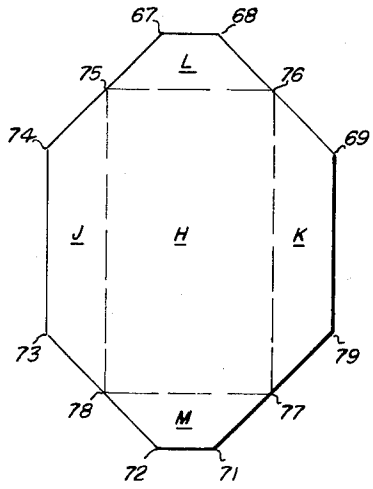


FIG. 8

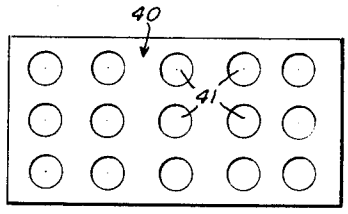


FIG. 9

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3,251,075

INFLATABLE PILLOW

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Filed June 27, 1962, Ser. No. 205,733
1 Claim. (Cl. 5—337)

This invention relates to pillows, cushions, mattresses, or articles of a similar nature which provide support for the body when sitting or reclining, and more particularly to articles of this type which are capable of providing a soft, yieldable support of relatively large thickness when desired, but which will require only a small fraction of space for storage.

One object of the invention is to provide a pillow, or the like, of generally rectangular shape which is capable of being expanded in thickness for use, but may be collapsed substantially flat when not needed.

Another object of the invention is to provide an inflatable pillow, or the like, which may be completely deflated for packing or storage, and is capable of inflation in varying degrees in accordance with the use to which the article is to be put.

Still another object of the invention is the provision of an inflatable bladder means capable of expansion and contraction in thickness without changing its over-all dimensions in width and length.

Still another object of the invention is to provide a novel blank capable of being fabricated into an inflatable bladder of generally rectangular configuration, but which will retain its rectangular configuration regardless of the extent of inflation.

Other objects and advantages will be apparent to those skilled in the art after reading the following specification in connection with the attached drawings, in which:

FIG. 1 is a perspective view of one form of inflatable pillow in accordance with the present invention and shown in expanded condition;

FIG. 2 is a cross-section taken on the line 2—2 of FIG. 1;

FIG. 3 is a cross-section taken on the line 3—3 of FIG. 1;

FIG. 4 is a perspective view on a slightly enlarged scale showing the bladder means in expanded condition;

FIGS. 5 and 6 are similar to FIGS. 2 and 3, except that the article is shown in contracted condition;

FIG. 7 is a plan view of one form of blank which may be used to fabricate the bladder means;

FIG. 8 is a plan view of another form of blank for fabricating the bladder means, and;

FIG. 9 is a plan view of one form of interior support for the bladder means.

Referring now to the drawings in detail, there is shown in FIG. 1, a preferred form of the completed invention comprising essentially an outer covering, indicated generally by the numeral **10**, and an intermediate enclosure, or padding, indicated generally at **11**; and an expandable air bladder, indicated generally by the numeral **12**.

The outer covering **10**, may comprise a fabric cover composed of two rectangular pieces of material such as percale **13** and **14**, sewed together on three sides along the seam **15** and having the fourth side joined by closure means such as a conventional zipper **16**.

The intermediate enclosure **11** provides not only a quality of resistant softness characteristic of a conventional pillow, such as one filled with down or foam rubber, but also is capable of a certain amount of lateral expansion and contraction (in accordance with the extent to which the inner bladder **12** is inflated), but does so

in such a manner that the exterior surface will remain smooth and unwrinkled regardless of the extent of this expansion or contraction.

For this purpose, a layer of yieldable cellular material may be employed, such as foamed latex rubber. Two rectangular slabs of this material may be joined along their margin edges **20** and **21** as by heat-sealing or gluing to form an envelope within which the bladder means **12** is contained.

The intermediate core may be covered by an expansible fabric covering **17** and, in addition, it may be considered desirable to cover the exterior of the bladder with similar material **18**. Both of these coverings could be a tubular length of fabric such as cotton jersey.

It should be understood that the padding **19** is preferably composed of one of the various types of slab-like foamed cellular plastics, synthetic or otherwise, although it need not necessarily be composed of a slab-like material. If the inner and outer covering **17** and **18** are used, the padding could be contained between them and could be composed of materials normally used for stuffing pillows, such as goose-down, feathers, particles of spongy Dacron, or the like.

From an inspection of FIG. 4, it will be seen that the bladder **12**, when inflated, is a generally rectangular body having top and bottom panels **22** and **23**, respectively, side panels **24** and **25**, respectively, and end panels **26** and **27**, respectively. The opposite end margins of the panel **25** are notched, one end being cut along the line **28, 29** and **30**, the other end being cut along the line **31, 32** and **33** to provide a bellows-like action. It should be noted that the marginal line between **28** and **29** is disposed at a 90 degree angle with respect to the margin extending between **29** and **30**; similarly, the margin **31, 32**, is disposed at a 90 degree angle with respect to margin **32, 33**. A line extending between the points **29** and **32** will be disposed parallel to and midway between the upper and lower parallel margins **28, 31**, and **30, 33**, respectively. The end panel **26** is also provided with notched end margins indicated at one end by the line **28, 29** and **30**, and at the other end by the line **34, 35** and **36**. The line **28, 29**, on end panel **26** is also disposed at 90 degrees with respect to the end margin **29, 30**, just as it was in the case of the side panel **25**.

At the other end of panel **26**, the margin between **34** and **35** is disposed at 90 degrees with respect to the margin between **35** and **36**, and a line between points **29** and **35** is also arranged midway and parallel to the upper and lower parallel margins **28, 34**, and **30, 36**, respectively. The configuration of the other end panel **27** is substantially identical to that of panel **26**, just described, one end margin of panel **27** being defined by a line between points **31, 32** and **33**, while the other end margin is defined by a line extending between points **37, 38** and **39**.

It will thus be seen that the side and end panels **24, 25, 26** and **27** provide, in effect, a form of bellows which permits the bladder to expand and contract, and at the same time, to allow the top and bottom panels **22** and **23** to remain in substantially flat parallel relationship with each other regardless of the amount of inflation of the bladder. Within the bladder **12**, there is also provided a lateral supporting means which may comprise a diaphragm **40** of rectangular shape having its dimensions proportional to those of the top and bottom panels, but of smaller size. The margins of this diaphragm are defined by the points **29, 32, 38** and **35**, and it is joined along its periphery to the side and end panels along the lines defined by these points. The purpose of the diaphragm is to prevent the side and end panels from blowing outwardly beyond the edges of the top and bottom panels when the bladder is expanded. The diaphragm

itself is perforated by a large number of openings **41** to allow free passage of air between the upper and lower sections of the bladder. A standard valve mechanism **42** is provided in one of the end panels to allow the admission of air into the bladder.

The material of which the bladder is to be constructed is of some importance to the success of the invention. The top, bottom, side and end panels should be constructed of some relatively thin flexible, air-impervious, sheet material, which, however, has substantially no elasticity or stretch. It should, however, be capable of a slight amount of deformation since it is obvious that there will be a slight change in the configuration and dimensions of the side and end panels depending upon whether the pillow is deflated, as shown in FIGS. 5 and 6, or inflated, as shown in FIGS. 2 and 3. On the other hand, if the material used had the elasticity of a sheet of ordinary latex rubber, the pillow would provide no support for the head of the user when inflated.

Materials satisfactory for the fabrication of the bladder are those classed as synthetic vinyl resins, but other synthetic sheet plastics having similar physical characteristics would be suitable. While the diaphragm **40** is intended primarily to confine the lateral expansion of the bellows-like side and end panels and therefore the material used in its fabrication should have a characteristic primarily of non-stretchability; materials used for the construction of the remainder of the bladder have sufficient resistance to stretch to be suitable for forming the diaphragm.

While it would be possible to fabricate the bladder by cutting out a large number of individual pieces of sheet material and joining them together along the fold lines by conventional bonding methods such as dielectric heating, or by means of adhesives as is well known in the sheet plastic art, it is preferable to cut out a single blank such as the one disclosed in FIG. 6 of the drawings.

This blank may comprise a main body portion A, defined by the fold lines **43, 44, 45** and **46**. This portion will form either the top or bottom panel when fabricated, but it will be assumed for purposes of later illustration that it will become the bottom panel **23**.

The blank in FIG. 6 also includes an upper bellows section B, a lower bellows section C, and side bellows portions D and E. The upper bellows portion B is defined by the fold lines **43, 44**, and **47, 48**, having notched side margins defined, respectively, by the numerals **47, 49, 43** and numerals **48, 50** and **44**. The numerals **49** and **50** also defining the fold line in the mid-portion of the bellows. The lower bellows portion is defined by the fold lines **46, 45**, and **51, 52**, having notched margins **46, 53, 51**, and **45, 54, 52**. The end bellows section D is defined by the fold line **43, 46**, and the parallel exterior margins **55, 56**, with upper and lower notched margins defined, respectively, by numerals **55, 57, 43**, and **56, 58, 46**. In the completed article, this panel D becomes the end panel **26** with the fold line **57, 58**, of the blank becoming fold line **35, 29**, of the completed bladder.

The other end bellows section E is defined by the fold line **44, 45**, and the exterior margin, **59, 60**, having upper and lower notched margins defined by the numerals **44, 61, 59**, and **45, 62, 60**, respectively. This bellows section becomes the end panel **27** in the completed article, the fold line **61, 62**, being equivalent to the fold line **38, 32**, of the completed article.

Extending above the bellows section B is the rectangular tab portion F, while depending below the bellows portion C is a rectangular tab portion G. The tab F is defined by the fold line **47, 48**, the exterior parallel margin **63, 64**, and end margins **63, 47**, and **54, 48**. The depending tab portion G is defined by the fold line **51, 52**, and the exterior parallel margin **65, 66**, and has end margins **51, 65**, and **52, 66**.

The total area of tabs F and G is substantially equivalent to the top panel **22** with a slight overlap between the exterior margains of these panels to allow for bonding them together.

In fabricating the bladder from the blanks shown in FIG. 6, the portions B, C, D, E, are folded inwardly about their respective fold lines **43–44, 44–45, 45–46**, and **46–43**, and at each of the four corners the portions of the notched corners are joined to each other by suitable means along their entire length. Thus, the marginal portion **43–49** will be joined to the marginal portion **43–57**, as by means of adhesive or in the case of suitable materials, by means of dielectric heating, or other appropriate means.

At the other corners, the margin **44–50** will be joined to margin **44–61**; margin **45–62** will be joined to the margin **45–54**, and margin **46–58** will be joined to margin **46–53**. After this procedure, the respective bellows portions B, C, D and E, will be folded outwardly and back along their medial fold lines; namely, **49–50; 53–54; 57–58**, and **61–62**. The diaphragm **40** may then be put in place and joined along its marginal edges to the abutting sections B, C, D and E, along the fold lines just enumerated.

The remaining end marginal portions of the bellows sections are then joined to each other along their abutting edges. In this case, the margin **47–49** will be in abutting relationship with the margin **55–57**. Similarly, margin **48–50** will be joined to margin **59–61**; margin **60–62** will be joined with margin **52–54**, and margin **51–53** will be joined with the margin **56–58**.

At this point, only the flap portions F and G will remain unsealed and they should then be folded inwardly along their respective fold lines **47–48** and **51–52**, in which position the exterior margin **55–56** of the bellows portion D will be in abutment with the margin **47–63** of the flap F and margin **51–65** of the flap G, and they should be joined with each other along their entire abutting portions.

The exterior margin **59–60** of the bellows portion E will be in abutting relationship with the margin **48–64** of flap F and the margin **52–66** of the flap G, and these marginal portions should be joined together. Finally, the abutting margins **63–64** of flap F will be joined with the abutting margin **65–66** of the flap G.

These operations having been completed, a bladder similar to that disclosed in FIG. 4 will have been completed by the insertion in one of the end panels of the valve **42**.

Another form of blank for fabricating the bladder is shown in FIG. 7, but in this instance, two such blanks must be used. In this modified form, the blank is octagonally shaped having marginal edges defined by the numerals **67–68–69–70–71–72–73–74**. A central rectangular area H is defined by the fold lines **75–76–77–78**, which area in the final fabricated article will comprise either the top panel **22** or the bottom panel **23**. At each side of the central area H, there are two trapezoidally shaped areas J and K, one of which is defined by the fold line **75–78** and the margins, **78–73–74–75**; the other of which is defined by the fold line **76–77**, and the margins **77–70–69–76**. Above and below the area H are the trapezoidally shaped areas L and M, one of which is defined by the fold line **75–76** and the margins **76–68–67–65**; the other being defined by the fold line **77–78** and the margins **78–72–71–77**.

To complete the finished product, the portions J, K, L and M, are all turned inwardly along their respective fold lines and their abutting margins are joined to each other; that is to say, margin **75–75** is joined with the margin **67–75**; margin **68–76** is joined to the margin **69–76**; margin **70–77** is joined with margin **71–77**, and margin **72–78** is joined with the margin **73–78**.

Another similar blank is prepared in the same way,

after which they will be brought into opposing relationship with a diaphragm member **40** incorporated between them. In this position, the margin **69–70** of one of the blanks will be joined with the margin **73–74** of the other blank and one side margin of the diaphragm. The margin **73–74** of the first blank will be joined with the margin **67–70** of the second blank and the other side margin of the diaphragm. However, the margin **67–68** of one blank will be joined with the similarly enumerated margin of the other blank and in the margin of the diaphragm. And, finally, the margin **71–72** of both blanks will be joined together and with the remaining margin of the diaphragm.

Furthermore, it should be understood, as has been previously stated, that the purpose of the diaphragm member **40** is to provide lateral support for the bellows-like action of the side and end panels of the bladder. Therefore, while the most practical manner of providing this lateral support is to fabricate the diaphragm in a single sheet, it would also be possible to subdivide it into two or more separate pieces extending between opposite side panels.

Similarly, while it is more practical to join the diaphragm member with the side panels along its entire marginal surface, this would not be necessary so long as the diaphragm is secured to the side and end panels at spaced intervals sufficient to provide the necessary transverse strengthening.

Having disclosed several forms in which the invention may be practised, it will be evident to those skilled in the art that various modifications and improvements may be made which would come within the scope of the annexed claim.

We claim:

An inflatable pillow comprising, a pair of substantially flat sections of yieldable padding material substantially co-extensive in area, means to confine a body of air between said sections to position them in vertically spaced substantially parallel relation, said air-confining means including bellows-like vertically expandable bladder means composed of air-impervious flexible substantially non-stretchable material disposed between the respective flat sections, said bladder means including substantially rectangular upper and lower portions joined along their respective peripheries with vertically extending expansible and contractable foldable portions, and restraining means for the bladder means being contained within the bladder means joined to opposite side portions thereof to limit outward movement thereof composed of a generally rectangular sheet of non-stretchable material extending in a plane parallel with said upper and lower portions joined with all of the side portions at their mid-sections.

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