

Nov. 3, 1953

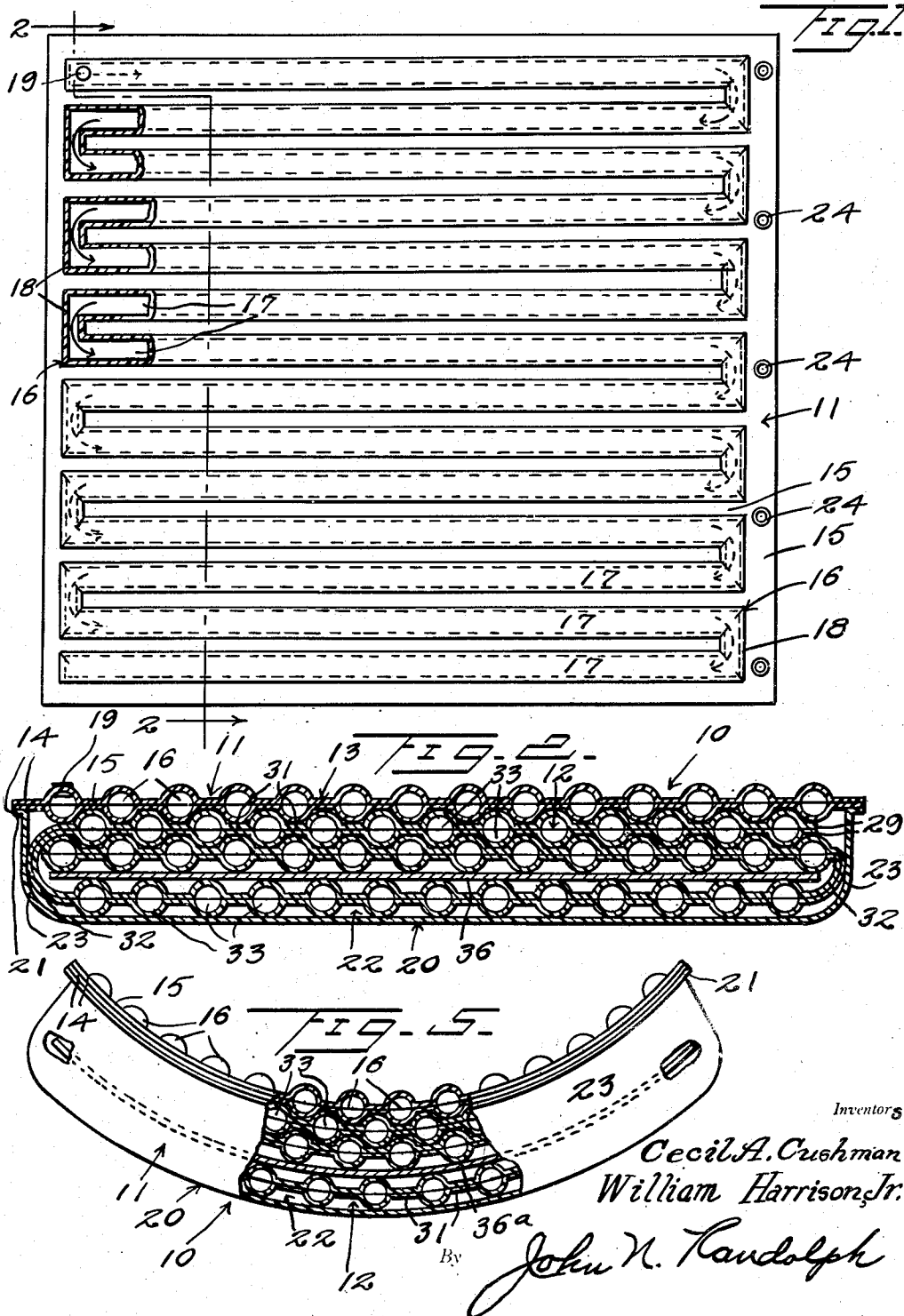
C. A. CUSHMAN ET AL

2,657,385

MULTIPLE PNEUMATIC PROTECTION PAD

Filed Aug. 3, 1951

2 Sheets-Sheet 1



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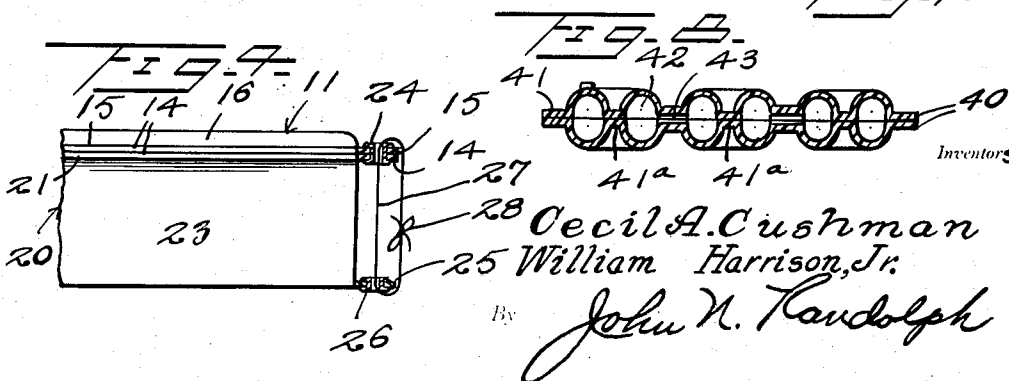
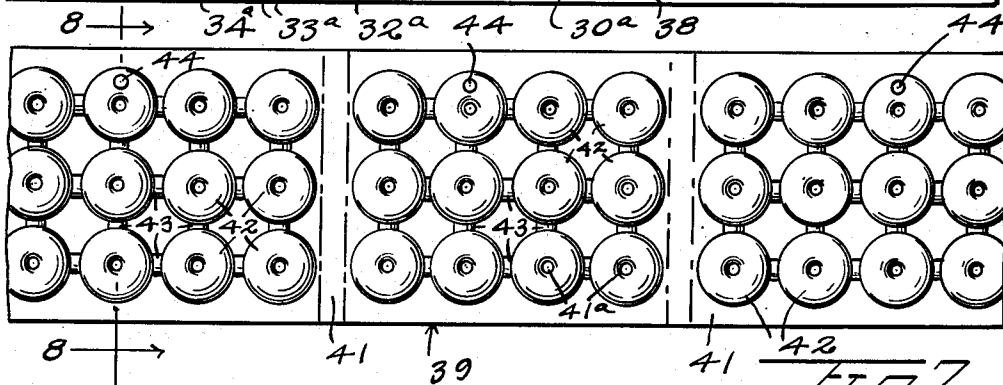
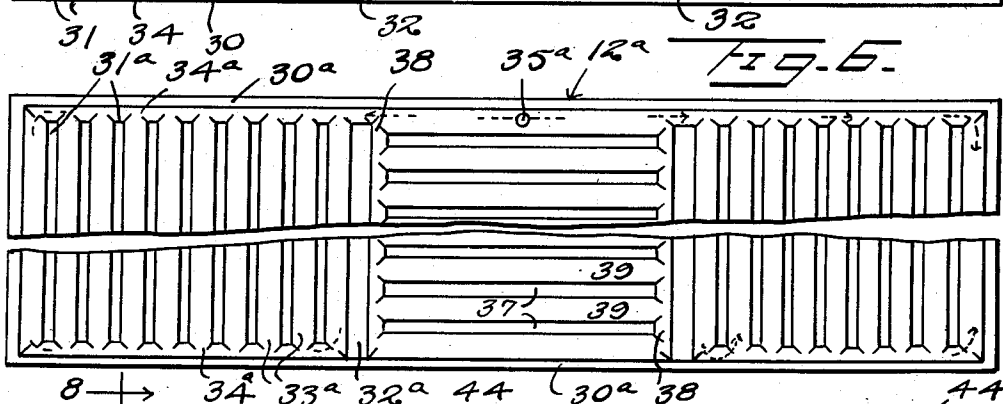
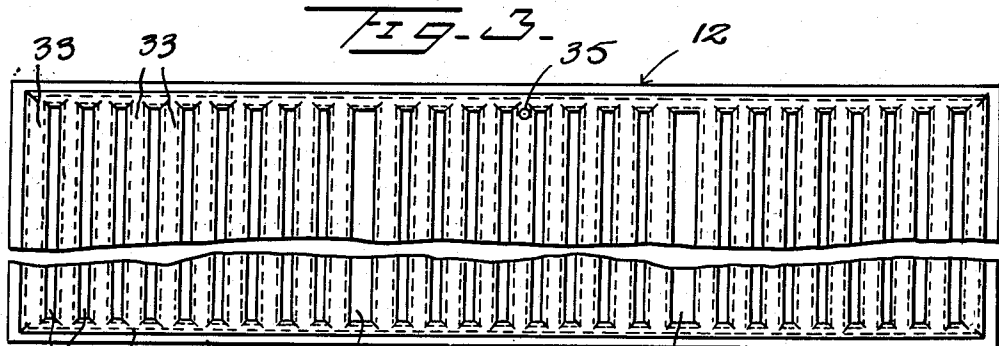
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MULTIPLE PNEUMATIC PROTECTION PAD

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2 Sheets-Sheet 2



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MULTIPLE PNEUMATIC PROTECTION PAD

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10 Claims. (Cl. 2-24)

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This invention relates to a novel inflated pad for use by athletes participating in games embodying bodily contact, such as football players and which is likewise well adapted for use by drivers of racing vehicles, aviators and others needing protection with outside objects.

Another object of the invention is to provide a pad which will afford a maximum of protection to the knees, elbows or other parts of the body of the user over which the pad is applied and which may be made sufficiently soft and yieldable as not to violate the rules of certain sports prohibiting the use of a hard pad and which, due to the flexibility of the pad, will more readily shape itself to the part of the body to be protected thereby.

A further object of the invention is to provide a pad which may be inflated to any desired extent and which may include any desired number of folds each constituting an inflated section.

Still a further object of the invention is to provide a pad including an outer casing section having an inflated side and removably containing an inner inflated section composed of a plurality of folds or layers.

Still another object of the invention is to provide a pad capable of being combined with a semi-rigid element interposed between certain of the inflated folds thereof for shaping the pad to more effectively conform to the contour of a body portion over which the pad is disposed.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a top plan view, partly in section, illustrating a preferred form of the pad;

Figure 2 is a cross sectional view thereof taken substantially along a plane as indicated by the line 2-2 of Figure 1;

Figure 3 is a plan view on a reduced scale of a part of the pad as shown in Figures 1 and 2;

Figure 4 is a fragmentary side elevational view of the pad as shown in Figure 1;

Figure 5 is an end elevational view, partly in section thereof showing the pad as it will appear with a particular shaping insert;

Figure 6 is a view similar to Figure 3 showing a slightly modified form of the pad section of Figure 3;

Figure 7 is a fragmentary plan view of another modification of the pad section of Figure 3, and

Figure 8 is a cross sectional view thereof taken substantially along a plane as indicated by the line 8-8 of Figure 7.

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Referring more specifically to the drawings, a multiple pneumatic protection pad as illustrated in Figures 1 to 5 is designated generally 10 and includes an outer casing section, designated generally 11 and a removable inner section, designated generally 12. The sections 11 and 12 may be formed of various flexible nonporous materials such as plastic and rubber but are preferably formed of plastic since such material of a given thickness is lighter in weight and more durable as well as much stronger than rubber or other nonporous material and is equally as pliable or flexible.

The outer casing 11 forms a pocket having a side wall, designated generally 13 formed of two plies 14 of the nonporous material which are vulcanized together along abutting portions thereof to provide the vulcanized abutting portions 15 between which are disposed unvulcanized areas which when inflated form a lapped tube 16 having parallel extending leg portions 17 which are connected by connecting portions 18. The connecting portions 18 are staggeredly arranged as seen in Figure 1 and connect complementary end portions of adjacent legs 17 of the tube 16. The tube 16 is provided with a conventional type valve 19 preferably disposed at one end thereof and which is preferably of the type employed in bladders of footballs and basketballs and into which a needle is inserted for inflation and which closes automatically upon removal of the needle for sealing the inflated member. The outer casing 11 also includes a strip 20 of a material corresponding to the plies 14 and which has outturned edges 21 along three of the four sides thereof which are vulcanized or otherwise secured to three of the four vulcanized edge portions 15. The strip 20, as seen in Figures 2 and 5 forms with the wall 13 a pocket, designated generally 22, said strip 20 having a portion which is spaced from and disposed substantially parallel to the side wall 13 and inturned edge portions 23, of which the flanges 21 form continuations, which form three sides of the pocket 22, as seen in Figures 2 and 5. As seen in Figure 4, the fourth edge portion of the wall 13 is provided with a plurality of spaced grommets or eyelets 24 which are formed in the fourth vulcanized edge portion 15 thereof and the other, complementary edge 25 of the strip 20 which is disposed beneath said last mentioned vulcanized edge portion is provided with similar eyelets or grommets 26 which align with the grommets 24 for receiving a lace 27 which is laced through the grommets 24 and 26 and tied as indicated at 28 in Figure 4 for closing the open

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edge of the pocket 22 sufficiently to retain the inner pad section 12 therein, as illustrated in Figures 2 and 5.

The inner pad section 12, as best seen in Figure 3, is of a length substantially greater than the length of the outer casing 11 and as illustrated in Figures 2 and 5, is likewise composed of two plies each comprising a strip of a nonporous flexible material such as plastic which strips 29 have portions thereof secured together in abutting engagement as by vulcanizing. The vulcanized portions of the strips 29 include vulcanized side edge portions and end portions 30 and series of vulcanized transverse bar portions 31 which are divided into three sections separated by wider transversely extending vulcanized bar portions 32. The bar portions 31 and 32 combine to form transversely extending inflatable portions which are disposed therebetween and which, when inflated, constitute transversely extending tubes 33. The ends of the bar portions 31 and 32 are likewise spaced from the longitudinally extending vulcanized edge portions 30 to form longitudinally extending inflated tube portions 34 which communicate with the ends of the transversely extending inflated tube portions 33. The vulcanized bar portions disposed adjacent each end of the pad 12 likewise combine with the end portions of the vulcanized edges 30 to provide additional transverse inflated tube portions 33 which likewise communicate with the longitudinal inflated tube portions 34. One of the tube portions 33 preferably disposed intermediate of the ends of the pad 12 is provided with a valve 35, corresponding to the valve 19.

After the pad 12 has been inflated to a desired pressure, one end section thereof is folded over onto the intermediate section and the other end section is then folded over the first mentioned end section, as illustrated in Figure 2 and with the tube portions of the intermediate and end sections disposed in interfitting relationship. The folded pad 12 is then inserted through the open edge of the pocket 22 after which the lace 27 is applied and tied, as illustrated in Figure 4 to retain the pad 12 in the pocket 22. The wall 13 of the outer casing 11 is then inflated through the valve 19 and the tube portions 17 thereof assume positions in interfitting relationship to the tube portions 33 of the end section of the pad disposed adjacent thereto, as illustrated in Figures 2 and 5, so that the fully assembled inflated pad 10 provides an inflated area of substantially uniform thickness throughout its length and width. The multiple pneumatic pad 10 as thus assembled and inflated may be applied against any desired portion of the body and may be suitably secured thereto or to a garment covering said body portion and the pad 10 will be sufficiently flexible so that if disposed to cover a joint such as an elbow or knee it will afford ample protection to the joint without adversely hampering the movement thereof. If it is desired to apply the pad to flat surface of the body as for example against the back, said pad 10 may be slightly rigidified or stiffened to maintain a flat condition as illustrated in Figure 2 by the insertion of a stiffening member therein, as for example a plate 36 which is preferably formed of fiber and preferably inserted between the first mentioned end section of the pad 12 and its intermediate section, as illustrated in Figure 2, so that the stiffening member 36 will be cushioned on both sides thereof by inflated pad portions. If, on the other hand it is desired to cause the pad to assume an arcuate

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shape to fit the contour of the leg or arm, an arcuate stiffening member 36a corresponding to the member 36 except that it is of arcuate or curve shape may be inserted between the first mentioned end of the pad 12 and its intermediate portion, as illustrated in Figure 5.

Figure 6 illustrates a slightly modified form of inner pad designated generally 12a including end sections corresponding to the end sections of the pad 12 having the transverse vulcanized bar portions 31a, the vulcanized edge portions 30a, the longitudinally extending inflatable tube portions 33a and the transversely extending inflatable tube portions 33a. The pad 12a also includes the wider vulcanized bar portions 32a dividing the sections which differ from the bar portions 32 in that one end of each bar portion 32a joins a vulcanized longitudinal edge portion 30a so that only one longitudinal tube portion 34a extends throughout the length of the three pad sections. The intermediate pad section differs from the end pad section in that it is provided with vulcanized bar portions 37 in lieu of the bar portions 31a, which extend longitudinally of the pad 12a and have ends which are spaced from the transverse bar portion 32a, to provide transversely extending inflatable tube portions 38 which extend between the vulcanized bar portions 32a and the ends of the vulcanized bar portions 37 and each of which communicates with the longitudinal tube portion 34a, which extends from end-to-end of the inflated pad sections. Likewise, the tube portions 38 communicate with the ends of longitudinally extending tube portions 39 which are disposed between the bars 37 and between one of the bars 37 and the longitudinal edge portion 30a with which the bars 32a connect. The pad 12a is provided with a valve 35a, corresponding to the valve 35 and which communicates with the tube portion 34a, which extends substantially the length of the pad, and preferably intermediate of the ends of said tube portion, so that air may pass from the valve in all directions to simultaneously inflate the three sections of the pad 12a. The pad 12a is employed with the outer casing 11 in the same manner as the pad 12, as previously described and as illustrated in Figures 2 and 5.

Figures 7 and 8 illustrate another form of inner pad, designated generally 39, which is likewise formed of two plies each comprising a strip of plastic 40 and which plies have vulcanized portions 41 dividing the pad 39 into three sections each of which includes a plurality of circular or annular unvulcanized portions which when inflated form annular tubes 42, each of which has a central vulcanized portion 41a, as best illustrated in Figure 8. The pad sections are also provided with a network of unvulcanized portions extending between and communicating with the annular tube portions 42 which form inflated communicating passages 43 between the various tube portions 42 of each pad section. As clearly illustrated in Figure 7, the inflated portions 42 and 43 of each pad section are separated from the inflated portions of the other pad sections by vulcanized portions 41 so that one of the tube portions 42 of each pad section of the pad 39 is provided with a valve 44, each of which valves correspond to the valve 19 or 35. It will likewise be readily apparent that the pad 39 may be inflated and folded similar to the pad 12 for insertion into the outer casing 11 and it will also be apparent that if desired the sections of the pad 39 may be inflated to different pressures.

It will also be apparent that the valves 19, 35, 35a and 44 may be sealed, if desired, after the pads have been inflated to a desired pressure to prevent over or under inflation of the pads by the user.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

We claim as our invention:

1. A multiple pneumatic protection pad comprising an outer section and an inner section, said outer section comprising a casing formed of a flexible material defining a pocket having an opening along an edge of said outer section, one side wall of said outer section being formed of two plies of a nonporous material having portions secured together in abutting engagement and other unsecured portions forming an inflatable tubing, said inner section being formed of two plies of flexible nonporous material having portions thereof secured together in abutting engagement disposed between and surrounding other unsecured portions of said last mentioned plies, said last mentioned unsecured portions forming inflatable tube portions, said inner section being disposed within the pocket of the outer section to provide an inflated multiple pad when the tube portions of said sections are inflated, and the means connecting the edges of said outer section defining the open edge of said pocket for retaining the inner section therein.

2. A multiple pneumatic pad as in claim 1, said inner section including transversely extending longitudinally spaced relatively wide abutting portions dividing the inner section into an intermediate part and end parts, said end parts being folded onto the intermediate part to form three folded pad portions when the inner section is disposed in the pocket of the outer section.

3. A multiple pneumatic pad as in claim 2, said inflated portions of the outer section including parallel tube portions and communicating tube portions extending between said parallel tube portions, the inflated portions of said inner section including spaced parallel tube portions and longitudinally extending tube portions connecting said parallel tube portions, said parallel tube portions of the folds of the inner section being disposed in staggered interfitting relationship to one another, and the parallel tube portions of said outer section being disposed in staggered interfitting relationship to the tube portions of the adjacent fold of the inner section.

4. A multiple pneumatic pad as in claim 1, said inner section being folded to provide a plurality of inflated folds disposed within said pocket, and a substantially flat stiffening member disposed in the pocket between certain of said folds for maintaining the pad in substantially a flat condition.

5. A multiple pneumatic pad as in claim 1, said inner section being folded to provide a plurality of inflated folds disposed within said pocket, and a stiffening member interposed between certain of said folds, said stiffening member being bowed from end-to-end thereof to conformably shape the inflated pad.

6. A multiple pneumatic pad as in claim 1, the inflatable portion of said outer section and the inflatable portion of said inner section each being provided with at least one valve.

7. A multiple pneumatic pad as in claim 1, said inner section including an intermediate portion and corresponding end portions, each of said corresponding end portions including a plurality of transversely extending inflated tube portions and said intermediate portion including a plurality of longitudinally extending inflated tube portions, and a connecting inflated portion communicating with each of said longitudinally and transversely extending tube portions.

8. A multiple pneumatic pad as in claim 1, said inner section being composed of corresponding end portions and an intermediate portion, each of said portions having a separate inflated portion including a plurality of annular inflated tube portions each connected to other of said annular tube portions by other inflated portions forming communicating passages.

9. A multiple pneumatic pad as in claim 1, said inner section having its inflated portions composed of a plurality of spaced annular tube portions and connecting passage portions extending between and communicating with said annular tube portions.

10. A flexible pneumatic pad comprising a casing defining a pocket, an inner pad disposed within said pocket and having a plurality of lapped folds each including an inflated area having substantially parallel inflated portions, the inflated portions of said folds being spaced apart and disposed in staggered interfitting relationship, one wall of said casing defining the pocket having an inflated area including substantially parallel inflated portions disposed in staggered interfitting relationship to the parallel inflated portions of the fold of the pad disposed adjacent thereto and forming a part of the pneumatic pad and combining with the inflated portions of the lapped folds to provide an inflated pad area of substantially uniform thickness.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
871,760	Long	Nov. 19, 1907
2,000,873	Arens	May 7, 1935