United States Patent [19]

Marcoux

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[45] **Dec. 16, 1975**

[54] **SANDAL**

[76] Inventor: **Emery Marcoux,** 445a Fleury St., Montreal, Quebec, Canada

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[21] Appl. No.: **498,365**

[30] **Foreign Application Priority Data**

Aug. 20, 1973 Canada 179208

[52] **U.S. Cl.** **36/11.5**

[51] **Int. Cl.²** **A43B 3/12**

[58] **Field of Search** ..... 36/2.5 R, 11.5, 2.5 B, 36/25 R, 45

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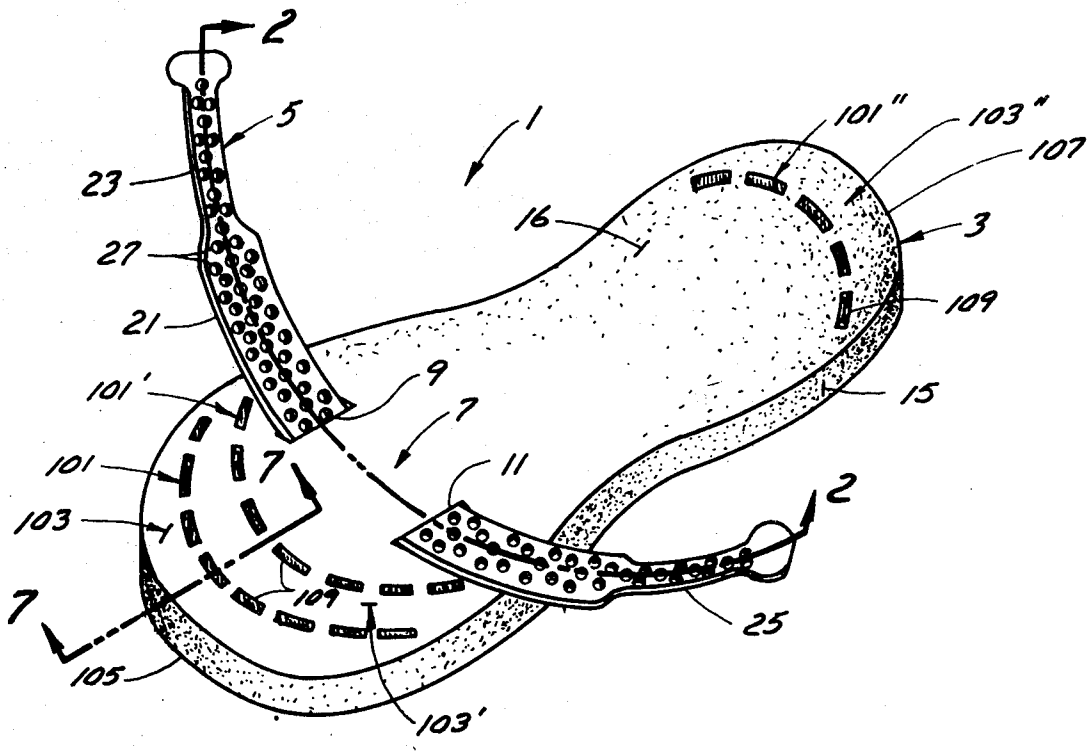
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Primary Examiner—Patrick D. Lawson

[57] **ABSTRACT**

This invention is directed towards improvements in inexpensive sandals and components making up the sandals. The sandals have a sole member and a strap which is mounted on the sole member in a manner permitting the sandals to be worn on large or small feet. The sole member of the sandal can be adjustable in length, if desired, and the strap is also adjustable in length along with being very flexible so as to conform to the wearer's foot.

9 Claims, 17 Drawing Figures



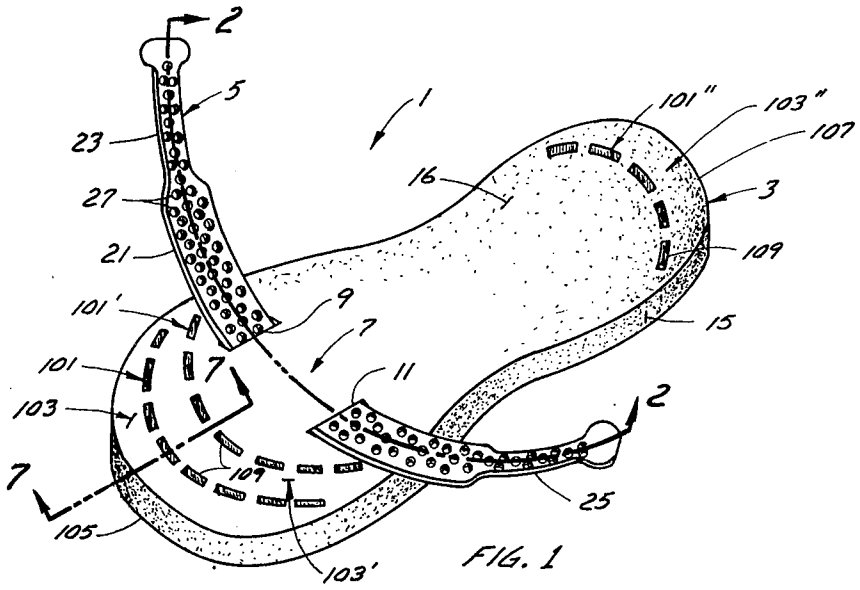


FIG. 1

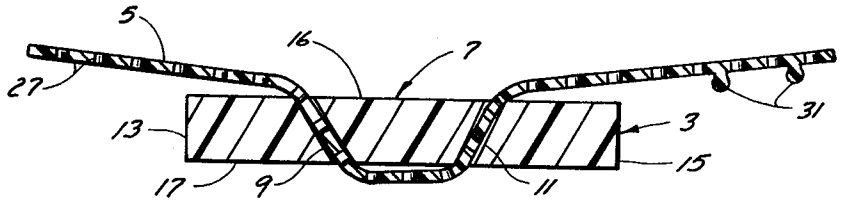


FIG. 2

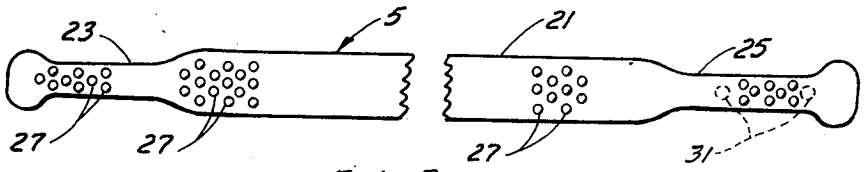


FIG. 3

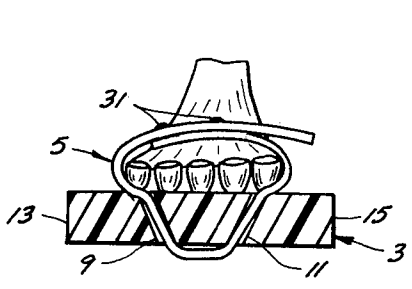


FIG. 2a

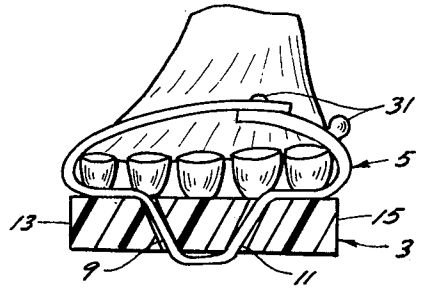


FIG. 2b

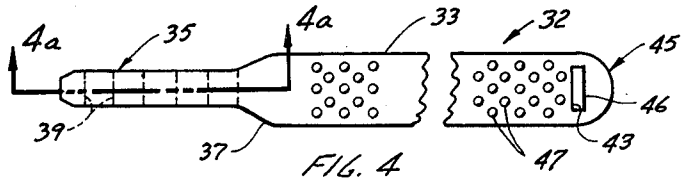


FIG. 4

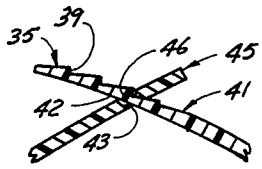


FIG. 4b

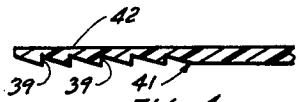


FIG. 4a

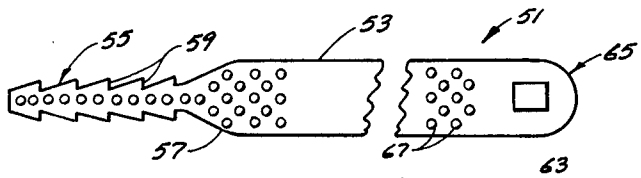


FIG. 5

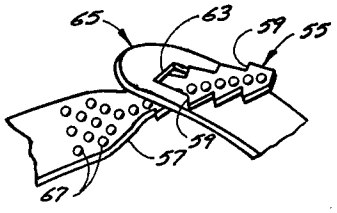


FIG. 5a

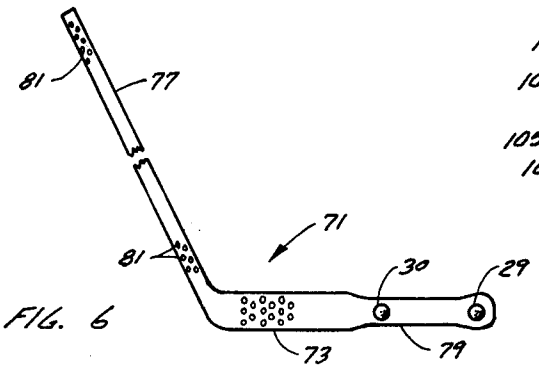


FIG. 6

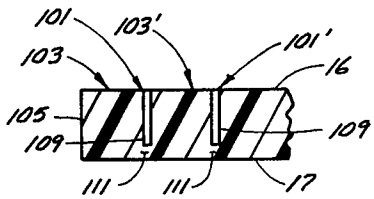


FIG. 7

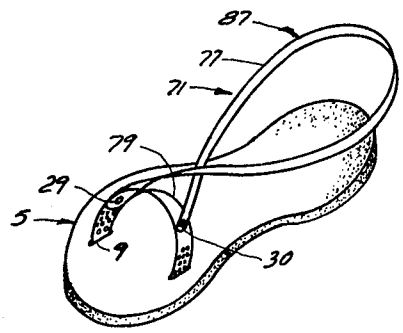


FIG. 6a

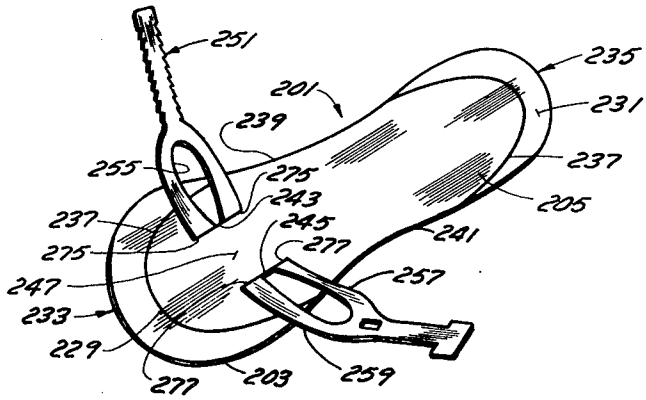


FIG. 8

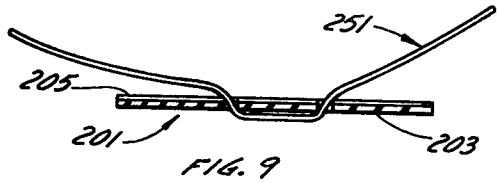


FIG. 9

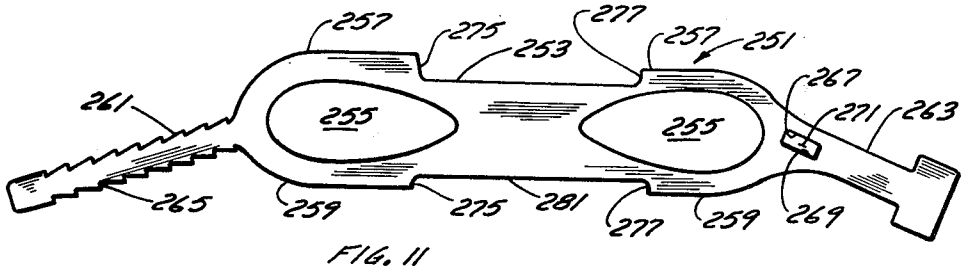


FIG. 11

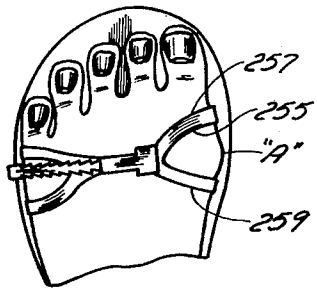


FIG. 12

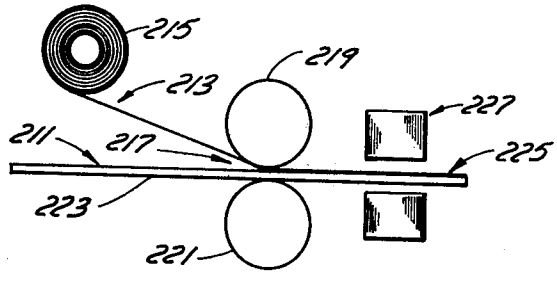


FIG. 10

SANDAL

This invention is directed towards improvments in footwear.

The invention is more particularly directed towards improvements in inexpensive, sandal-type footwear and also to improvements in the componets making up sandal-type footwear.

Sandal-type footwear is well known. However, as far as is known, no one sandal is made which can be used by both children and adults. Instead, sandals are usually made in a plurality of different standard sizes, for both children and adults, and this, of course, increases their cost.

Therefore, it is one purpose of the present invention to provide a sandal which can be satisfactorily worn, with minimum adjustment, on large or small feet.

It is a further purpose of the present invention to provide a sandal which is inexpensive to manufacture and which is comfortable when worn. It is also a purpose of the present invention to provide inexpensive components making up the sandal of the present invention.

The invention, in one embodiment, is more particularly directed towards a sandal having a sole member with means for mounting a strap substantially transversely on the sole member in the region of the sole member which supports the ball of the foot of the sandal wearer. The means comprises a pair of longitudinal slots in the sole member. Each slot preferably is spaced a substantial distance in from the side edge of the sole member nearest to it, and the slots are spaced apart a distance corresponding to the width of the smallest foot size to be accommodated.

The sole member of the sandal preferably is made of laminate construction.

Preferably, the sandal strap has perforations over substantially its entire area to provide longitudinal and lateral flexibility in the strap. The perforations allow the strap to more closely and comfortably conform to the wearer's foot.

Alternatively, the strap can be provided with an aperture on at least one side of the strap, the aperture positioned to receive the head of the first metatarsal bone of the wearer's foot when wearing the sandal.

In another embodiment, the invention is directed towards a sandal having a sole member, means mounting a strap on the sole member and means defining at least one removable section at one of the heel or toe ends of the sole member for use in shortening the sole member, if required. Preferably, the means defining the removable section comprise a row of holes, extending substantially across the sole member, and extending down from the top surface of the sole member to terminate just short of the bottom surface. The holes are close together, permitting the removable section to be torn or broken away from the remainder of the sole member.

In a further embodiment of the present invention, a sole member is provided having a pair of longitudinal slots through which a sandal strap can be threaded. The slots are located in the region of the sole member which receives the ball of the foot of the sandal wearer. Each slot preferably is located a substantial distance inwardly from the side edge of the sole member nearest it, and the slots are spaced apart a distance corresponding to the width of the smallest foot size to be accommodated.

The sole member can preferably be made as a laminate having one layer made of one material and a second layer made of material more flexible than the first layer. Preferably, the one layer is a bottom layer made from thermoplastic material and the other layer is a top layer made from fibrous material.

The invention is also directed toward a method for making the laminate sole.

In still another embodiment of the present invention, a sole member is provided with means defining at least one removable section at one of the heel or toe ends of the member for use in shortening the member, if desired.

In a further embodiment of the present invention, a strap for use in holding sandals on a wearer's foot is provided, which comprises a strip of material with perforations substantially throughout its entire area and means on the strap for adjustably joining it to itself.

In still another embodiment of the invention, a strap for use in holding a sandal on a wearer's foot can be provided which strap has an aperture on at least one side, the aperture positioned to receive the head of the first metatarsal bone of the wearer's foot when wearing the sandal. This aids in holding the sandal on the foot.

The strap can also be provided with means for preventing the strap from moving relative to a sandal sole when mounted on the sole.

The invention will now be described in detail having reference to the accompanying drawings, wherein:

FIG. **1** is a schematic view of a sandal showing one embodiment of the invention;

FIG. **2** is a cross-section taken along line **2—2** of FIG. **1** showing details of the strap mounting;

FIGS. **2***a* and **2***b* are cross-sections similar to FIG. **2** showing how the sandal can be used by persons with big or small feet;

FIG. **3** is a plan view of the sandal strap used in the sandal shown in FIG. **1**;

FIG. **4** is a plan view of another type of sandal strap;

FIG. **4***a* is a cross-sectional view of the strap shown in FIG. **4** taken along line **4***a*—**4***a*;

FIG. **4***b* is a cross-sectional detail showing how the strap of FIG. **4** is closed on itself;

FIG. **5** is a plan view of still another type of strap;

FIG. **5***a* shows how the ends of the strap of FIG. **5** are attached together;

FIG. **6** is a plan view of still another type of strap;

FIG. **6***a* shows, how the strap in FIG. **6** can be employed;

FIG. **7** is a cross-sectional view taken along line **7—7** of FIG. **1** showing in detail how the sole member of sandal can be modified to be shortened, if desired;

FIG. **8** is a perspective view of another sandal embodiment of the present invention;

FIG. **9** is a cross-section view taken along line **9—9** in FIG. **8**;

FIG. **10** is a schematic view of an apparatus for making a sole of the sandal shown in FIG. **9**;

FIG. **11** is a plan view of another strap embodiment, the strap used in the sandal of FIG. **8**; and

FIG. **12** illustrates how the strap of FIG. **11** operates.

The sandal **1** shown in FIG. **1** comprises a sole member **3** and a sandal strap **5**. The sole member **3** can be made out of suitable, inexpensive, material which is preferably water-proof. Preferably, the sole **3** is made out of thermplastic foam material, such as foam poly-

styrene or foam polyurethane, which provides a relatively thick and rigid sole. The sole conforms readily to the foot of the wearer giving slightly and compressing, where pressure is applied at the heel and ball of the foot, to have the top surface conform to the contour of the wearer's sole. To reinforce the sole, the foam material can be covered on the top face and preferably on both faces with a flexible film, such as polyethylene adhered to the foam material. The film may be perforated. The strap **5** is made from suitable, somewhat stiff material, preferably a suitable thermoplastic material. Both the strap and sole can be made of inexpensive material, so the sandals can be thrown away after one wearing, if desired.

The sole member **3** is provided in one size only, that of a large adult size. It is provided in both left and right modes. In the region **7**, which receives the ball of the foot of the sandal wearer, means are provided for mounting the strap **5**. These means comprise two longitudinal slots **9, 11** which are angled inwardly, down towards each other and which extend through the sole, as shown in FIG. **2**. The slots **9, 11** are each located a substantial distance inwardly from the respective side edge **13, 15** of the sole member nearest it. The slots **9, 11**, at the top surface **16** of the sole, are spaced apart a distance corresponding to the width of the smallest foot size to be accommodated. The strap **5** is threaded from the top surface **16** of the sole down through slot **11**, along the bottom surface **17** of the sole, to the other slot **9** and back up through it, as shown in FIG. **2**. The slope of the slots **9, 11** minimize cutting of the relatively soft sole by the relatively harder strap. The sandal construction is such that it can be worn by a child or an adult, as shown in FIGS. **2***a* and **2***b* respectively. This is due to the manner of mounting the strap **5** to the sole **3** and the location of slots **9, 11**.

The strap **5** comprises a piece of normally stiff material having a main body **21** with a tongue **23, 25** extending from each end of the main body, as shown in FIG. **3**. The main body **21**, along with the tongues **23, 25**, have perforations **27** throughout substantially their entire area. These perforations permit the strap to be more easily flexed both transversely and longitudinally so that the strap can conform closely to the contour of the foot of the wearer of the sandal.

Fastening means are provided on the strap to join it to itself. These means can comprise a first bulbous protuberance **31** and a second protuberance **31**, if desired, preferably integrally formed with one tongue **25**, and which, when the tongues **23, 25** are overlapped, can be inserted into one of the perforations **27** on the tongue **23**, to lock the overlapped tongues together.

The strap **5** can be provided with other forms of suitable closing means. One such other form is shown in FIG. **4**. Here a strap **32** has a main body **33** with a tongue **35** extending from one end **37** of the main body. The tongue has a plurality of slanted teeth **39** on one surface **41**, as shown in FIG. **4***a*. The other surface **42** of the tongue is smooth, since this is the surface which will lie against the skin of the wearer of the sandal. A narrow slot **43** is provided at the other end **45** of the main body **33** through which the tongue **35** can be inserted. One of the teeth **39** co-operates with the edge **46** of slot **43** to hold the ends together when the tongue is inserted through the slot, as shown in FIG. **4***b*. As before, the strap is provided with a plurality of perforations **47** over substantially its entire area, so as to provide flexibility in both the longitudinal or transverse directions.

In still another embodiment as shown in FIG. **5**, a strap **51** can be provided having a body **53** with a tongue **55** projecting from one end **57**. The tongue is provided with teeth **59** on both side edges. The tongue is inserted into a slot **63** on the other end **65** of the body **53**, as shown in FIG. **5***a*. Again, the strap is provided with perforations **67** over substantially its entire area.

Straps **5, 31**, and **51** are all adapted to be over the instep of the sandal wearer. In still another embodiment of the present invention as shown in FIG. **6**, a strap **71** can be provided for mounting the sandal about the ankle of the wearer. In this embodiment, the strap **71** comprises a main body **73** having a length substantially equal to the width of the foot of the sandal wearer. A long narrow strip **77** extends off on an angle from one end of the main body. A short narrow strip **79** extends off from the other end of the main body **73**. Strip **79** extends away from strip **77**. The entire strap is provided with perforations **81** over substantially its entire area. Suitable means are provided on the strap for closing it on itself. These means can be the buttons **29** and **30**, similar to those shown in FIG. **3**, or toothed tongue, as shown in FIG. **4** or FIG. **5**. The strap **71** can be threaded through slots **9, 11** in the sole **3** of the sandal and after fastening one to an intermediate portion at **29**, the strap is looped about an ankle and crossed over in a figure eight configuration **87** to be attached at **30**.

The sandal can be made to be shortened, if desired. As shown in FIGS. **1** and **7**, the sole **3** can be provided with means **101, 101'**, etc. defining removable sections **103, 103'**, etc. These means **101, 101'**, etc. can be provided at one or both of the toe and heel ends **105, 107** of the sole. The defining means **101, 101'**, etc. each comprises a row of holes **109**, as shown in FIG. **7**, which extend down from the top surface **16** of the sole towards the bottom surface **17** of the sole. The holes **109** do not quite go through the sole. Instead, a break- or tear-away portion **111** is left at the bottom of each hole. The holes are preferably elongated and located close together, as shown in FIG. **1**. The rows of holes **101, 101'**, etc. curve across the sole.

In operation, if it is desired to shorten the sandal, one or more sections, **103, 103'**, etc. can be broken away from the rest of the sole, along the respective row **101, 101'**, of holes. The holes, in not extending completely through the sole, prevents water from passing up through the holes of the top surface. Because the sole is preferably made of a relative stiff, expanded foam-type material, such as polystyrene or polyurethane as previously stated, the sole can be easily broken away along the rows, if shortening is desired.

In another embodiment of the invention, the sole of the sandal may be made in laminate form. As shown in FIGS. **8** and **9**, the sole **201** can comprise a bottom layer **203** of synthetic thermoplastic material such as, for example, polystyrene or polyurethane, and a top or covering layer **205** of fibrous material, such as, for example, crepe paper. The crepe paper layer **205** serves to provide soft, absorbent contact with the sandal wearer's foot, and also serves to retain the shape of the sole **201**. Polystyrene or polyurethane are relatively rigid or brittle, and may crack or break during use. The crepe paper layer **205** on the other hand is flexible and, attached to the thermoplastic layer, holds it together if it does break. For this reason, a thinner thermoplastic

layer 203 can be used in the laminated sole than the thickness of the thermoplastic layer used in a single layer sole.

The fibrous layer 205 can be attached to the thermoplastic layer 203 by adhesive or any other suitable means. A preferred manner, however, of attaching the layer 205 to layer 203 is shown in FIG. 10. A sheet 211 of thermoplastic material is fed from a supply source (not shown) along with a layer 213 of fibrous material, such as crepe paper, from its supply roll 215, to a nip 217 formed between a pair of pressure rolls 219, 221. The top roll 219 is heated to slightly soften the top surface 223 of the sheet 211 and the crepe layer 213 is mechanically bonded to the softened surface 223 of the thermoplastic sheet 211 under pressure. The laminated sheet 225 so formed then passes through a blanking die 227 which stamps out the soles 201.

The sole 201 can be provided with one or more break-away portions 229, 231 at each of the toe and heel ends 233, 235 respectively of the sole, if desired. These break-away portions permit the length of the sole to be shortened to more comfortably accommodate smaller feet. Each break-away portion 229, 231 is defined by a curved score line 237 extending between edges 239, 241 of the sole. Each score line 237 passes through the crepe paper layer 205 and penetrates into the thermoplastic layer 203. This permits the break-away portions to be easily broken and removed from the sole, if desired. The score lines 237 are formed when stamping out the soles in the blanking die 227.

The sole 201 is provided with a pair of spaced-apart slots 243, 245 located inwardly of the sole edges 239, 241 and in the region 247 where the ball of the wearer's foot would rest. An adjustable strap 251 is threaded down through one slot 243, across the bottom of the sole and up through the other slot 245 to be used to fasten the sandal to a wearer's foot. As previously described, the distance between slots 243, 245 is made substantially equal to the width of the smallest foot to be accommodated while the sole is made as wide as the largest foot to be accommodated.

Strap 251, as shown in FIG. 11, is constructed to minimize the possibility of having the sandal slip off the foot. To this end, the main body portion 253 of the strap has an elongated, large aperture 255 at each end forming two spaced-apart bands 257, 259 which extend away from body portion 253. The bands 257, 259 at each end merge into projecting tongues 261, 263. One tongue 261 has slanted teeth 265 formed in its sides which teeth 265 cooperate with the sides 267, 269 of a slot 271 in the other tongue 263 to tie the strap together. In tying the sandal on the wearer's foot as shown in FIG. 12, one side of the strap passes over the head "A" of the first metatarsal bone in the wearer's foot. This head "A" projects or bulges out from the side of the foot. The apertures 255 are made wide enough so that the bands 257, 259 pass over the side of the wearer's foot on either side of head "A" with the head projecting out through the aperture 255 on that side. The bands 257, 259, acting on either side of head "A" reduce the possibility of the sandal slipping relative to the foot.

Putting an aperture 255 on each side of the strap 251, permits the same strap to be used on either foot. The apertures 255 are elongated sufficiently to receive the head of the metatarsal bone of large or small feet. The apertures 255 also provide the strap with flexibility.

To prevent the strap 251 from slipping in slots 243, 245 relative to the sole, the strap 251 can be provided with spaced-apart shoulders 275, 277 on each side 279, 281 of the main body portion 253. The distance between shoulders 275, 277 on each side is equal to, or slightly greater, than the distance between slots 243, 245 plus twice the sole thickness. Also, the distance between the shoulders at each end of the main body portion is slightly greater than the length of the slots 243, 245. Thus, after the strap has been threaded through the slots, the shoulders abut the top surface of the sole at each slot locking the strap in place. The strap can be readily deformed to initially pass it through the slots.

While sole 201 has been described in combination with strap 251 to form one type of sandal, it is obvious that sole 201 can be used with straps 5, 32, 51 or 71 previously described. Also, strap 251 can be used with sole 3 previoysly described. Also, strap 251 can be closed by suitable means other than the teeth and slot described.

What I claim is:

1. A sandal having a sole member, means for mounting a strap substantially transversely of the sole member in the region of the sole member which supports the ball of the foot of the sandal wearer, said means comprising a pair of longitudinal slots in the sole member through which the strap is threaded and further including means defining at least one removable section at one of the heel or toe ends of the sole member for use in shortening the sole member, if desired.

2. A sandal as claimed in claim 1, wherein each slot is spaced a substantial distance in from the side edge of the sole nearest to it and the slots are spaced apart a distance corresponding to the width of the smallest foot size to be accommodated.

3. A sandal as claimed in claim 1, wherein the sole member is of laminated construction having a bottom layer made from thermoplastic material and a second layer made of a fibrous material more flexible than the thermoplastic material.

4. A sandal as claimed in claim 1, wherein the defining means comprises at least one row of blind holes, the row substantially traversing the sole member, each hole extending down from the top surface of the sole member through almost the entire thickness of the sole member.

5. A sandal as claimed in claim 1 the sole member made from one of polystyrene or polyurethane.

6. A sandal as claimed in claim 1, wherein said sole member is of laminated construction having a bottom layer made of a foam of synthetic resin and a top layer made of a flexible film adhered to the bottom layer.

7. A sandal comprising a sole member, a strap, means for mounting the strap substantially transversely of the sole member in the region of the sole member which supports the ball of the foot of the sandal wearer, said means comprising a pair of longitudinal slots in the sole member through which the strap is threaded, and wherein the strap has an aperture on at least one side, the aperture positioned to receive the head of the first metatarsal bone of the wearer's foot when wearing the sandal to aid in holding the sandal on the wearer's foot.

8. A sandal as claimed in claim 7 wherein the strap has two such apertures spaced apart along the strap, and further including means on the strap cooperating with the sole member for preventing the strap from moving relative to the sole member when threaded

through the slots, said last-named means including oppositely facing pairs of shoulders formed by the two longitudinal edges of the strap inwardly of the respective apertures relative to the outer ends of the strap and engageable with the edges of the respective slots.

9. A sandal having a sole member, means for mounting a strap on the sole member, and means defining at least one removable section at one of the heel or toe ends of the sole member for use in shortening the sole member, if required.

* * * * *