

June 6, 1967

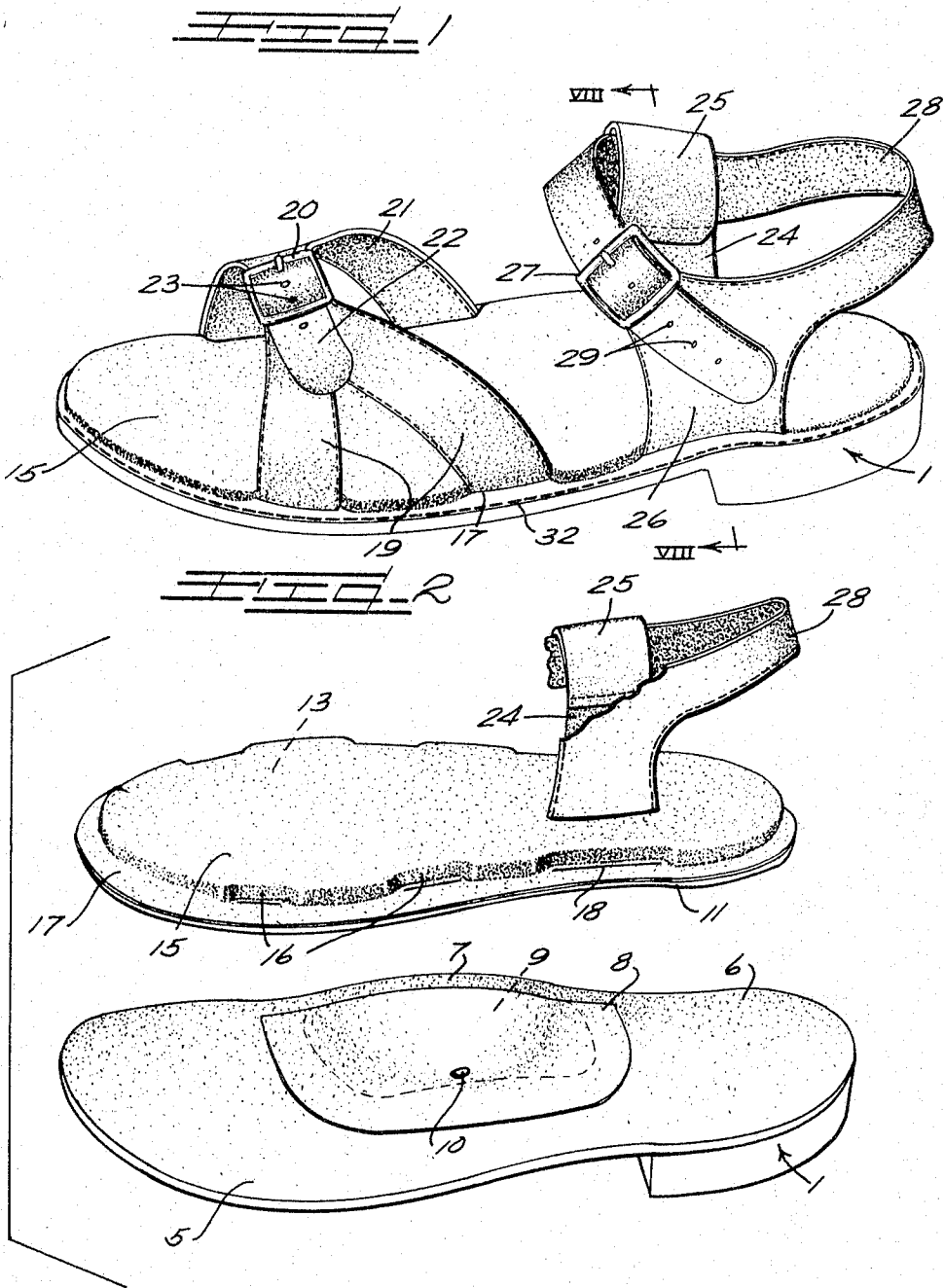
W. M. SCHOLL

3,323,233

ARTICLE OF FOOTWEAR AND METHOD OF MAKING THE SAME

Filed July 6, 1964

3 Sheets-Sheet 1



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ARTICLE OF FOOTWEAR AND METHOD OF MAKING THE SAME

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3 Sheets-Sheet 2

FIG. 3

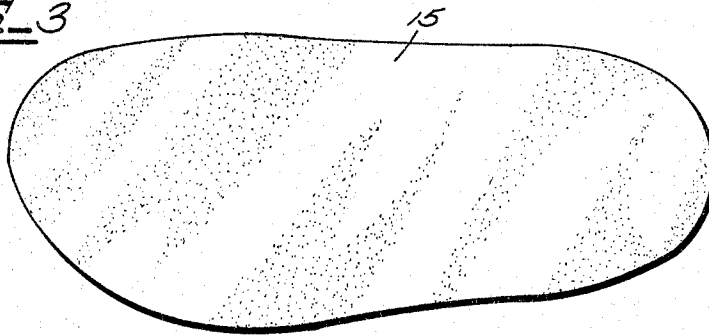


FIG. 4

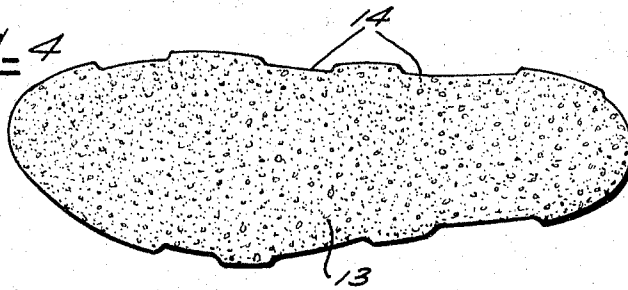


FIG. 5

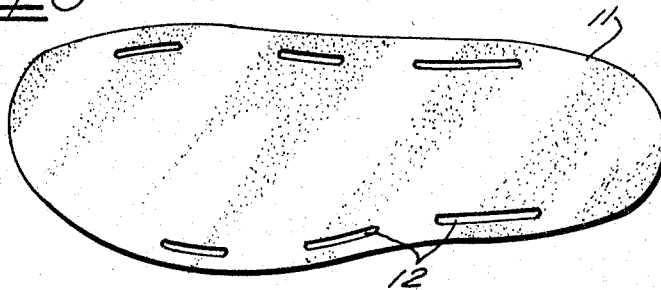
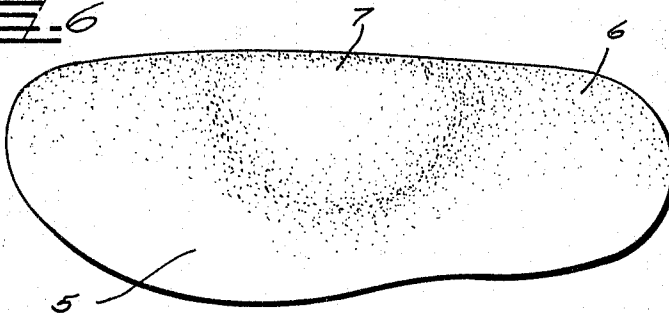


FIG. 6



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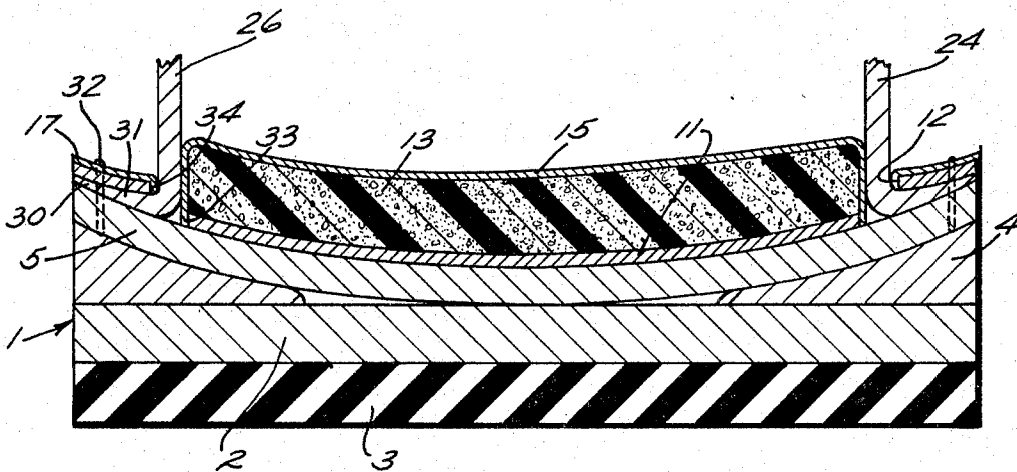
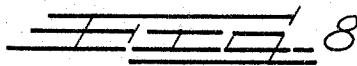
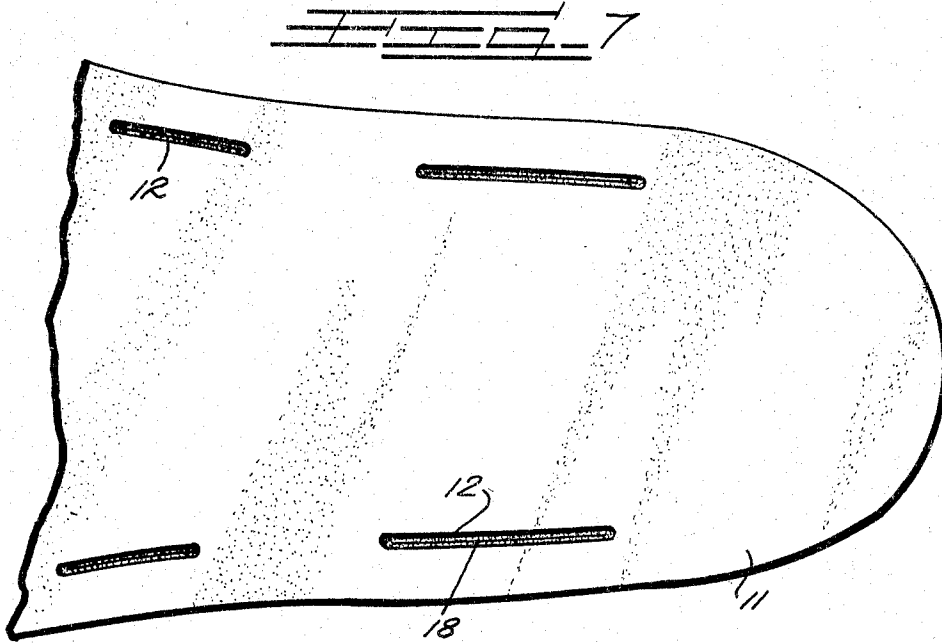
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ARTICLE OF FOOTWEAR AND METHOD OF MAKING THE SAME

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3 Sheets-Sheet 3



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3,323,233

ARTICLE OF FOOTWEAR AND METHOD OF MAKING THE SAME

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5 Claims. (Cl. 36—11.5)

This invention relates to improvements in an article of footwear and method of making the same, and more particularly to an article of footwear in the form of a sandal embodying cushioning means of a character that is self-conforming to the plantar surface of a particular foot, the method of making the article of footwear being satisfactory for use in other types of footwear, as will be apparent to one skilled in the art.

In the manufacture of articles of footwear of the sandal type and having an open heel, open toe construction, and wherein the upper comprises merely a plurality of straps, good appearance of the entire article of footwear is an essential for commercial success. Of course, it is also desirable that the sandal or other article of footwear provide a luxurious and pleasant feel to the foot of the user and in many cases actually cradle the foot in a soft and yielding manner. In the past, difficulty has been experienced in providing these attributes, particularly where a relatively thick layer of cushioning material was embodied in the structure. In many cases it was necessary to utilize various seams with which the plantar surface of the foot came in contact, in order to maintain the cushioning layer in proper position at all times, and such seams detracted from the general pleasing appearance of the article, prevented the cushioning material from being fully effective for its intended purpose, and in many cases, lined the plantar surface of the foot in accordance with the seams. Also, the methods of making sandal type footwear heretofore employed, particularly where the sandal was designed to both cushion and support the foot, were objectionably expensive.

With the foregoing in mind, it is an important object of the instant invention to provide a sandal or equivalent type of footwear that is both foot-supporting and foot-cushioning, and which provides a clean, unobstructed upper surface for contact with the plantar surface of the foot.

Another object of this invention is the provision of a sandal type article of footwear incorporating elevated cushioning means for contact with the foot, and utilizing straps as the entire upper, the attachment of the stray ends to the sole portion of the sandal being effectively concealed from the eyes of the user and others, thereby greatly enhancing the appearance of the sandal.

Still another object of this invention resides in the provision of a sandal type article of footwear incorporating a heel strap that is curvate along its longitudinal axis, whereby it better fits the foot above the heel than straight-cut straps heretofore utilized.

It is also an important object of this invention to provide a new, novel, and economical method of making an article of footwear with foot cushioning means incorporated therein.

While some of the more salient features, characteristics, and advantages of the invention have been above pointed out, others will become apparent from the following disclosures taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a plan perspective view of an article of footwear in the form of a sandal, embodying principles of the instant invention;

FIGURE 2 is a similar, but exploded, view of a part of the structure of FIGURE 1;

FIGURE 3 is a plan view of the light top cover of the sandal which is contacted by the foot;

FIGURE 4 is a plan view of the thicker layer of cushioning material disposed beneath the top cover of FIGURE 3;

FIGURE 5 is a top plan view of the inner sole upon which the structure of FIGURE 4 rests;

FIGURE 6 is a top plan view of the other sole;

FIGURE 7 is a greatly enlarged fragmentary bottom plan view of the structure shown in the center of FIGURE 2; and

FIGURE 8 is a greatly enlarged fragmentary vertical sectional view taken substantially as indicated by the line VIII—VIII of FIGURE 1, looking in the direction of the arrows.

As shown on the drawings:

By way of example, and not by way of limitation, the embodiment of the instant invention selected for illustrative purposes is in the form of a sandal. The illustrated sandal is for the left foot of the user and it will be understood that a sandal for the right foot of the user will be of a construction allochiral to the structure illustrated.

As seen in the drawings, the sandal comprises a heel, generally indicated by numeral 1, and which, as seen in FIGURE 8, may include an inner tap 2, preferably of leather, an outer tap 3, of leather, rubber composition, or other suitable material, and a horse-shoe shaped rand 4 on the inner tap to provide a cupped heel seat.

An outer sole 5, preferably a relatively thick sheet of high quality leather which has been preformed over a last to the general shape of the plantar surface of the normal foot, is disposed with the rear part thereof over the heel 1. The performing of the outer sole 5 provides a fixed concave formation 6 at the rear thereof to receive the heel of the foot and conforms with the cupped shape provided by the rand 4 of the heel, and this outer sole is also provided with a fixed upwardly domed portion 7 to underlie the longitudinal arch of the foot.

A combined shank stiffener and longitudinal arch support is disposed over the upwardly bowed portion 7 of the outer sole, as best seen in the lower part of FIGURE 2. This element comprises a cover layer 8 of leather or other suitable material, and a metallic upwardly bowed element 9 disposed therebeneath, the two members being held together by a rivet 10 or in an equivalent manner. The shaping of the metallic element 9 is complementary to the upwardly bowed portion 7 of the outer sole so these parts may be intimately engaged.

Disposed over the outer sole 5 and the cover 8 of the shank stiffener is an inner sole 11, which is thinner than the outer sole and may be made of any suitable material as known in the art of shoe manufacturing. The inner sole is preformed to the shape seen in FIGURE 5, and provided with a plurality of elongated slots 12 through which strap ends may pass in a manner later described.

On the inner sole a relatively thick layer 13 of cushioning material is disposed. This layer is preformed to the shape seen in FIGURE 4 and provided along its inner and outer edges with elongated notches 14, these notches being sized in accordance with the slots 12 in the inner sole, and there being one notch for each slot. Each notch borders the inner side of a slot in the inner sole, and the portions of the cushioning layer between the notches project laterally outwardly at least to the outer edges of the slots in the inner sole. The layer 13 of cushioning material is preferably thicker than any other part of the sandal construction, with the exception of the heel 1. The layer of cushioning material may be made of any of a number of materials satisfactory for the purpose, but it is preferably a thermoplastic foam

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from the group of foams including polyvinyl chloride, isocyanate or polyester, polyurethane, and similar foams, which are long lived and fungus proof. It is highly desirable to utilize a foam cushioning material that is self-conformable, in that it will assume the exact impression of the plantar surface of the particular foot resting upon it, and retains a conformation corresponding to the plantar surface of that particular foot for a relatively great length of time.

By way of specific example, one such foam material, proven highly satisfactory, both in tests and actual usage, is what might be termed a fully cured, closed cell, homopolymer, polyvinyl chloride foam having a skin on each side thereof, which adds strength and enhances slow recovery, since the skin substantially seals out air. This foam preferably has closed cells within the range of 70% to 100%, and the density of the foam may be approximately ten pounds per cubic foot. The foam layer may satisfactorily be approximately $\frac{1}{4}$ " or $\frac{5}{16}$ " in thickness. The foam has a very slow recovery factor. Under what might be termed a 50% compression test, foam of 0.125" in thickness was placed under a load sufficient to effect a reduction of foam thickness of 50% for 22 hours at 115° F. At the end of 22 hours the load was taken off and the material allowed to recover for two hours at 158° F. and then brought to room temperature before thickness was measured. The average for a series of such tests was 42% set and 58% recovery for the 22 hour period. However, with thicker foam as is the case with the instant invention, and in use at room or body temperatures, if the sandal is worn every day for a few days, some of the conformation in the foam will remain overnight, thus there will always be a substantially perfect fit to the plantar surface of a particular foot with the instant sandal. Conformation of the foam to the plantar surface of a foot is almost instantaneous when body weight is applied. There will be an impression of the heel, impressions at the first and fifth metatarsal heads, impressions of the toes, and elevations at the sulci of the toes, etc.

Over the layer 13 of cushioning material, a thin soft top cover 15 is disposed, which may satisfactorily be a piece of soft flexible leather. This top cover is placed over the foam layer and then worked down snugly around the bounding edge of the foam layer and into the notches 14, as indicated at 16 in FIGURE 2. The outer margin 17 of the cover rests tightly against the margin of the inner sole 11 outside the foam layer 13. The marginal portion 17 of the cover 15 is provided with a fine line cut or slit 18 in alignment with each of the slots 12 in the inner sole 11 as seen in FIGURES 2 and 7, such slit 18 being of less length and much less width than the corresponding slots. With such an arrangement, the cover layer provides a smooth unbroken and unobstructed surface for contact by the foot. The surface is devoid of seams and any other obstruction whatever where the foot comes in contact with it. Therefore, the cover and foam layer therebeneath may assume a conformation in keeping with the entire plantar surface of the foot and such conformation will be exceedingly accurate because the foam layer remains of even density throughout its entirety.

The forward part of the sandal is held on the foot of the user by means of an inverted V-shaped strap 19 on the outer side, which strap carries a buckle 20 or other suitable fastening means in a well-known manner at the apex of the V. Opposite the strap 19 is an inverted Y-shaped strap 21, the leg 22 of which is provided with a series of perforations 23 for adjustable engagement with the buckle 20. At the rear portion of the sandal, an upstanding strap 24 provided with a loop 25 at the top thereof is disposed on the inner side of the sandal. Opposite the strap 24 on the other side is an upstanding strap 26 which at its upper forward edge carries a buckle 27 in a known manner, and the rear end of which strap merges

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integrally with an elongated strap 28 that freely extends through the aforesaid loop 25 and the free end of which is provided with a series of apertures 29 for adjustable engagement with the buckle 27. It will be noted from the showings in FIGURES 1 and 2, that the strap portion 28 has a definite curvature along its longitudinal axis, this strap portion not being straight. It therefore more intimately fits around the foot above the heel than is the case of the straight straps, and it slides freely through the loop 25 so that a snug and proper fitting engagement with the foot is obtained, giving the user a complete sense of security and a pleasant feel with a minimum of movement of the heel of the foot relatively to the sandal.

As seen clearly in FIGURE 8, the ends of all the straps are passed through the respective slits 18 in the cover 15 and the respective slots 12 in the inner zone 11 in alignment with those slits. The ends are preferably skived as indicated at 30 to reduce their thickness outwardly, and are turned outwardly as shown at 31. A line of stitching 32 intimately joins the cover margin 17, the outer margin of the inner sole 11, the strap ends, and the outer sole 5 as seen in FIGURES 1 and 8.

In the making of the sandal, the two subassemblies are first formed, then joined together, and the heel subsequently attached by cement or equivalently to the underside of the outer sole. One of the sub-assemblies consists of the outer sole and the shank stiffener 9 with its flexible cover 8. The stiffener and cover are placed on the outer sole in the position seen in FIGURE 2 and attached by cement, the stiffener being spaced inwardly from the inner edge of the outer sole sufficiently to avoid the aforesaid line of stitching 32.

The other sub-assembly comprises the inner sole 11, the cushioning layer 13, the top cover 15, and the attaching straps. In forming this sub-assembly, the cushioning layer 13 is first cemented to the inner sole 11 with its notches 14 coinciding with the slots 12 in the inner sole. Then the cover 15 is cemented over the inner sole, worked down snugly around the edges of the foam layer and into the notches and then the outer margin is firmly cemented directly to the inner sole outside of the foam layer. This partial sub-assembly is then inverted to the position seen in FIGURE 7, and with the aid of a knife acting through the slots 12 in the inner sole, the slits 18 are provided through the top cover. The ends of the straps are then pushed through the slits in the cover and the slots in the inner sole, and turned outwardly beneath the inner sole of the position seen in FIGURE 8. Then this sub-assembly is cemented to the first sub-assembly, and the line of stitching 32 provided through the top cover, the inner sole, the strap ends, and the outer sole. Thereafter the heel is attached to the outer sole as mentioned above.

It will be especially noted that when the strap ends are forced through the respective slits in the top cover, the marginal portions around each slit will be turned down into the slot in the inner sole as indicated at 33 and 34 in FIGURE 8. This effectively conceals the attachment of the straps from the eyes of a viewer, because the openings through which the straps pass are virtually invisible from the top or side of the sandal. Also, there is no chance of dust, dirt, or debris entering the openings for the strap ends and setting up a destructive abrasive action between component parts of the sandal.

The completed sandal provides a luxurious feel to the foot of the user by virtue of the uninterrupted surface of the top cover over the cushioning layer for contact with the foot, the cushion layer conforms itself to the plantar surface of a particular foot providing an exceptional feeling of ease to the foot, the adjustable curvate heel strap provides a proper and snug engagement with the foot above the heel to add to the overall feeling of perfect relief. It will also be noted that the sandal has an excellent external appearance, the openings for the strap ends are effectively concealed from the eye of the observer,

and the straps seat in the covered notches of the foam layer so as to give a relatively smooth bounding appearance around the elevated cushion layer.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. The method of making a sandal type article of footwear; including the steps of
 - blanking out an inner sole having marginal elongated open slots for strap ends,
 - cementing a relatively thick cushion layer having elongated notches in the edge thereof for alignment with said slots to said inner sole,
 - cementing a smooth cover to said cushion layer and said insole outside the cushion layer and working said cover down around the edge of said layer and into said notches,
 - inverting the inner sole and providing a fine line cut through said cover at each said slot,
 - forcing holding strap ends through each said cut and the aligned slot carrying the margin of said cover around each cut down into said slots to disguise any openings for the strap ends, and
 - cementing the underside of the inner sole and protruding strap ends to an outer sole.
2. In the method of making a sandal type article of footwear, the steps of
 - blanking out an inner sole having a plurality of open marginal slots therein,
 - cementing a thin cover over said inner sole and the slots therein,
 - providing a fine line cut in said cover at each said slot, and
 - forcing strap ends through said cuts and slots carrying the cover material adjacent each cut down into the respective slot along with the strap end to conceal the strap opening in said cover.
3. In the method of making a sandal type article of footwear, the steps of
 - blanking out an inner sole having a plurality of open marginal slots therein,
 - cementing a thin cover over said inner sole and the slots therein,
 - providing a fine line cut in said cover at each said slot, and
 - forcing strap ends through said cuts and slots carrying the cover material adjacent each cut down into the respective slot along with the strap and to conceal the strap opening in said cover,
 - cementing the underface of the inner sole with the protruding strap ends outturned to an outer sole, and stitching said outer sole, strap ends, and inner sole together around the margin of the inner sole.
4. In a sandal type article of footwear,
 - an outer sole,
 - an inner sole having elongated open slots therein in the marginal portion thereof,

a comparatively thick layer of cushioning material having edge notches coinciding with the inner parts of said slots secured on said inner sole,

a thin cover disposed over and secured to said layer and intimately fitting the side edge and notches of said layer with a margin therearound secured flatly to said inner sole,

said cover having fine line cuts therein coinciding with said notches and slots,

attaching straps with end portions extending through said cuts and slots and turned outwardly beneath said inner sole,

the margin around each of said cuts being turned downwardly inside said notches to conceal the attachment of the strap ends,

said inner sole and turned strap ends being secured to said outer sole, and

a line of stitching through the outer margins of said outer sole, inner sole, cover and through said strap ends.

5. In a sandal type article of footwear,

- an outer sole,
- an inner sole having elongated open slots therein in the marginal portion thereof,

a comparatively thick layer of cushioning material having edge notches coinciding with the inner parts of said slot secured on said inner sole,

a thin cover disposed over and secured to said layer and intimately fitting the side edge and notches of said layer with a margin therearound secured flatly to said inner sole,

said cover having fine line cuts therein coinciding with said notches and slots,

attaching straps with end portions extending through said cuts and slots and turned outwardly beneath said inner sole,

the margin around each of said cuts being turned downwardly inside said notches, and

said inner sole being secured to said outer sole with said turned strap ends therebetween,

whereby the upper face of said cover is free, smooth and unimpeded for contact by a foot and the attachment of said strap ends is substantially invisible.

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