

Dec. 19, 1967

G. T. RALPHS ETAL

3,358,335

APPARATUS FOR LASTING FOOTWEAR

Filed May 28, 1965

2 Sheets-Sheet 1

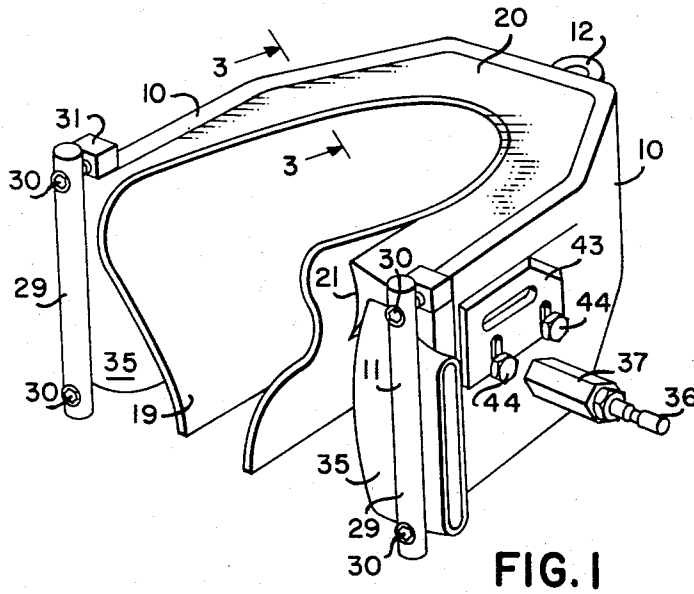


FIG. 1

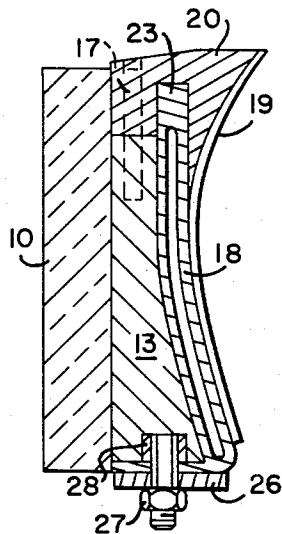


FIG. 3

INVENTORS.
GEORGE T. RALPHS
HAROLD A. BODDY

Dec. 19, 1967

G. T. RALPHS ETAL

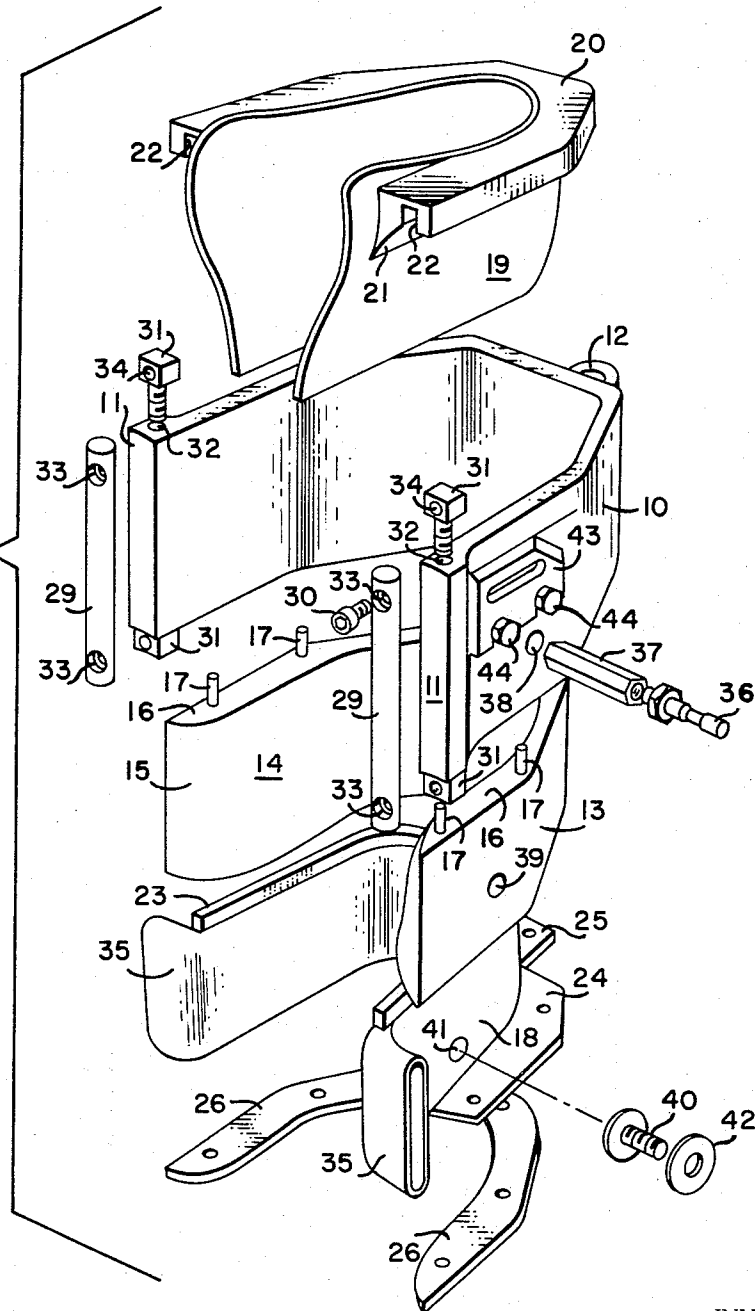
3,358,335

APPARATUS FOR LASTING FOOTWEAR

Filed May 28, 1965

2 Sheets-Sheet 2

FIG. 2



INVENTORS.
GEORGE T. RALPHS
HAROLD A. BODDY

1

3,358,335

APPARATUS FOR LASTING FOOTWEAR

George T. Ralphs, Oadby, and Harold A. Boddy, Leicester, England, assignors to Ralphs Unified Limited, Leicester, England

Filed May 28, 1965, Ser. No. 459,727

Claims priority, application Great Britain, May 30, 1964, 22,493/64

13 Claims. (Cl. 18—34)

ABSTRACT OF THE DISCLOSURE

A mould for engaging the end portion of a shoe upper which is constructed from the following three detachable components: an outer U-shaped support having its arms capable of relative movement laterally of the mould; an inflatable bag detachably carried within the support to extend around the mould; and an inner member comprising a shoe-engaging apron attached to a substantially non-yieldable backing piece which extends around the apron and provides solidarity at the region of the feather-line of the shoe, said apron being detachably carried within the outer support with the bag between the apron and the support. By this form of construction, the mould can be assembled from standard components which facilitates production in quantity of the moulds. Furthermore, if any of the components becomes damaged or worn in use, it can be readily detached and replaced by a new component.

This invention is for improvements in or relating to apparatus for lasting footwear and has for one of its objects to provide a mould of improved construction for use in shaping and gripping the end portion of a shoe during the performance of lasting operations thereon. The term "shoe" is used herein, wherever the context so permits, in a broad sense to include all forms of outer footwear. An ancillary object of the invention is to provide a mould which can be simply and easily maintained in working condition.

In accordance with the invention there is provided a mould for embracing the end portion of the upper of a shoe and comprising three components detachable from one another, namely an outer U-shaped support having its arms capable of relative movement laterally of the mould, an inflatable bag detachably carried within the support to extend around the mould, and an inner member comprising a shoe-engaging apron attached to a substantially non-yieldable backing piece which extends around the apron and provides solidarity at the region of the feather-line of the shoe, said apron being detachably carried within the outer support with the bag between the apron and the support. By this form of construction the mould can be assembled from standard components which facilitates production in quantity of the moulds. Furthermore after a mould has been in use if any of the components becomes damaged or worn it can be readily detached and replaced on site by a new component.

In a convenient form of construction the U-shaped support has its arms and central part formed as an integral unit with the arms relatively movable by resilient movement laterally of the mould. To this end the U-shaped support may be moulded from resilient plastic material (such as nylon) such that the arms are capable of resilient lateral movement to enable them to be closed resiliently inwardly to grip an end part of a shoe and when released to be splayed apart for introducing and removing the shoe end portion.

In a convenient construction the mould may have the U-shaped support fitted internally with a backing member

2

of horseshoe shape the arms of which are capable of moving with the arms of the support, fitted to the support between it and the inflatable bag. The backing piece of the apron may be anchored to this backing member, for example by resting on the top thereof and engaging with pins extending from the backing member.

The backing piece may have a flanged part secured to the apron and tapering in thickness away from the main body of the backing piece in the direction of the height of the apron, said flange being interposed between part of the inflatable bag and the apron.

In a convenient form of construction the mould may have one edge portion of the inflatable bag fitted in a groove in the backing piece of the apron and the bag at its other edge part may have a flange clamped to the backing member, the backing piece of the apron being also anchored to the backing member so that the sole fixing of the inner parts to the support is by means provided at the ends of the inflatable bag and serving to close the ends of the bag.

A convenient form of construction is illustrated by way of example in the accompanying drawings and will now be described with reference to the drawings in which:

FIGURE 1 is a perspective view of the assembled mould in readiness for use in a machine for moulding and lasting an end portion of a shoe;

FIGURE 2 is an exploded perspective view of the mould of FIGURE 1 showing the various parts which compose it, and

FIGURE 3 is a view of a part of the mould in cross-sectional elevation taken approximately at the position of the line III—III of FIGURE 1.

Referring to the drawings, the mould shown therein comprises a moulded outer support 10 substantially of horseshoe shape formed with a succession of angularly arranged flat portions for convenience in manufacture and having the ends of its arms thickened at 11. The support has running vertically from top to bottom centrally at its back a hollow cylindrical enlargement 12 forming a means by which it can be anchored pivotally at an appropriate position on a machine with which the mould is to be used, namely a shoe end moulding and lasting machine. Such a machine is referred to in our British Patent No. 958,212.

The support 10 is moulded from a suitable plastics material, for example nylon, causing it to possess appropriate rigidity for the purpose of its use combined with sufficient flexibility to permit the arms of the U-shaped container 10 to be deflected inwardly to grip and apply inward pressure to an already inserted end portion of a shoe upper on a partial form or last. A suitable material from which to form the support 10 is nylon. Within the support 10 there is detachably carried a backing member 13 which for some purposes may be considered to be an inward extension of the support though it is mounted so as to have some freedom for up and down movement in relation to the support 10. The backing member 13 is curved to horseshoe shape on its inner face 14 and the ends of its arms are tapered by the inner face 14 being flared in an outward curve as indicated at 15. The backing member 13 has a flat upper face 16 positioned below the top of the support 10, from which face pins 17 project upwardly. Within the backing member 13 there is mounted a tubular inflatable bag 18 and within the latter there is detachably mounted an inner member comprising an apron 19 and a backing piece 20 extending around the top edge of the apron 19. The backing piece 20 forms a relatively non-compressible backing for the apron 19 which is to engage with and embrace the end portion of an upper of a shoe, the relatively incompressible backing being provided at the region of the feather line of the shoe.

The backing member 13 is conveniently made of the material sold under the registered trademark "Prescolan" as is also the tubular inflatable bag 18. The apron 19 is formed from a sheet of PTFE (polytetrafluoroethylene), while the backing piece 20 which is secured to it adhesively is conveniently made of the same material as the backing member 13. The apron 19 is shaped approximately to a form complementary to the end of a shoe upper, the heel end in the example illustrated, and has the backing piece 20 fixed to it at a position such that the backing piece will, by resisting compression, provide for a relatively strong and unyielding grip being applied to the shoe upper around the end of the shoe along the feather line. The backing piece 20 has a cross section such that it provides an internal downturned lip 21 tapering in thickness downwardly and a groove 22 extending around it in its underface and adapted to receive an upwardly extending ridge portion 23 formed along the top edge of the inflatable tubular bag 18. Outside the groove 22 the underface of the backing 20 is formed with appropriately positioned holes to enable the backing member to be impaled on the pins 17 to retain it in position thereon when assembled as shown in FIG. 1. The lower edge portion of the inflatable tubular bag 18 is provided with outwardly directed flange portions 24 and 25 which are adapted to be clamped to the underface of the backing member 13 (see FIG. 3). The clamping is effected by two or more metal plates 26 apertured to receive screws or bolts 27 which are screwed into screw threaded metal thimbles 28 set into the material of the backing member 13.

It will thus be seen that the parts 13, 18 and 19, 20 fit together to form an inflatable mould contained within the support member 10. They are held in place therein by clamping means applied to the ends of the inflatable tube 18 and comprising rods 29 formed with apertures 33 near their ends through which pass clamping screws 30 which screw into threaded apertures 34 formed in blocks 31 having stems which fit in apertures 32 formed in the enlarged ends 11 of the support member 10. The open ends of the inflatable tube 18 are turned over as shown at 35 in FIGS. 1 and 2 and trapped between the rods 29 and the ends of the arms of the support member 10. This clamping of the ends of the tube 18 closes the ends to prevent escape of air and also forms the supporting means for the parts within the support 10. The inner assembly of the mould is thus permitted to have a slight resilient up and down rocking movement within the support 10 about the ends of its arms which is advantageous in permitting the mould to adjust itself to the correct position in relation to the shoe end portion.

Inflation of the tubular bag 18 is arranged to be effected during the operation of moulding and lasting a shoe end part through a flexible tube attached to a connecting piece 37 which can pass through a hole 38 in one arm of the support 10 and through an aperture 39 in the backing member 13 to be attached to a screwed nipple 40 fitted in a hole 41 in the bag 18 and provided with a clamping washer 42.

FIGURES 1 and 2 show the one of two plates 43 provided at the opposite sides of the support 10 and fixed in place by screws 44. These plates co-operate with the operating means for closing the mould on to an inserted end portion of a shoe upper.

It will be appreciated that the construction shown provides a mould for the end part of a shoe upper of such construction that any parts which become worn or damaged in use can readily be replaced by fresh parts without requiring a complete replacement of the mould, or of its parts being of standardised construction.

It will be appreciated that instead of forming the support 10 as a single integral part it may if desired be formed in two pieces hinged together at the position of and about the axis of the hollow cylindrical enlargement 12.

The invention may be applied to a mould adapted to embrace the heel end of a shoe or to a mould adapted to embrace the toe end of a shoe, and in each case to embrace and apply pressure all over to the shoe upper to cause it to conform to an inner shape or form whilst the margin of the upper is being lasted over an insole.

What we claim is:

1. A mould for embracing an end portion of the upper of a shoe comprising three components detachable from one another, namely an outer U-shaped support having its arms capable of relative movement laterally of the mould, an inflatable bag detachably carried within the support to extend around the mould and an inner member comprising a shoe-engaging apron attached to a substantially non-yieldable backing piece which extends around the apron and provides solidarity at the region of the feather line of the shoe, said apron being detachably carried within the outer support with the bag between the apron and the support.

2. A mould according to claim 1 wherein the U-shaped support has its arms and central part formed as an integral unit with the arms relatively movable by resilient movement laterally of the mould.

3. A mould according to claim 2 wherein the U-shaped support is moulded from resilient plastic material such that the arms are capable of resilient lateral movement to enable them to be closed resiliently inwardly to grip an end part of a shoe and when released to be splayed apart for introducing and removing the shoe end portion.

4. A mould according to claim 1 wherein the U-shaped support is fitted internally with a backing member of horseshoe shape the arms of which are capable of moving with the arms of the support, fitted to the support between it and the inflatable bag.

5. A mould according to claim 4 wherein the backing piece of the apron is anchored to the said backing member by resting thereon and engaging with pins extending from the backing member.

6. A mould according to claim 1 wherein the inflatable bag is anchored to the backing piece of the apron by engagement with a groove therein.

7. A mould according to claim 1 wherein the backing piece has a flange part secured to the apron and tapering in thickness away from the main body of the backing piece in the direction of the height of the apron, said flange being interposed between part of the inflatable bag and the apron.

8. A mould according to claim 1 wherein the inflatable bag is in the form of a flattened tube which is clamped at its ends to the ends of the arms of the support and has its ends closed by clamping means.

9. A mould according to claim 8 wherein the inflatable bag has one of its edge parts anchored by engaging in a groove in another part of the mould and its other edge part provided with an out-turned flange which is held in place by clamping plates.

10. A mould according to claim 4 wherein one edge portion of the inflatable bag is fitted in a groove in the backing piece of the apron and the flange at the other edge part of the bag is clamped to the backing member, the backing piece of the apron being also anchored to the backing member so that the sole fixing of the inner parts to the support is by means of the clamping means at the ends of the inflatable bag.

11. A mould according to claim 1 having shoe engaging apron and backing piece formed by a shaped apron having approximately a form complementary to the end of a shoe upper and secured along its upper marginal part to a U-shaped substantially non-yieldable backing piece moulded from a material having some flexibility combined with resistance to compression.

12. A mould according to claim 11 wherein the backing piece has a cross section such as it provided an internal down-turned lip tapering in thickness downwardly and extending from an outwardly projecting flange.

5

13. A mould for embracing an end portion of the upper of a shoe comprising three components detachable from one another, namely an outer U-shaped support having its arms capable of relative movement laterally of the mould, an inflatable bag detachably carried within the support to extend around the mould and an inner member comprising a shoe-engaging apron with a substantially non-yieldable backing piece attached thereto, said backing piece extending around the apron over a part only of the depth of the apron to provide solidarity at the region of the feather line of the shoe and presenting a lip tapering in thickness away from the feather line region, and means detachably mounting said inner member within the outer support with the bag between the apron and the support.

5

10

15

6

References Cited

UNITED STATES PATENTS

1,365,267	1/1921	Oakley -----	18—17 X
1,563,096	11/1925	MacDonald.	
2,287,320	6/1942	Mitchell.	
2,579,801	12/1951	Crom et al.	
2,730,783	1/1956	Kennison -----	25—128 X
2,761,405	9/1956	Moller.	
2,874,392	2/1959	Campione -----	18—17 X
2,991,505	7/1961	VanScoyk -----	18—18
3,006,306	10/1961	Pfeiffer et al.	
3,056,183	10/1962	Pigeot -----	25—128
3,173,173	3/1965	Lister -----	18—17
3,182,354	5/1965	Berrill et al. -----	18—17

J. HOWARD FLINT, JR., *Primary Examiner.*