FOREIGN PATENTS OR APPLICATIONS
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Terminal Research Report on Artificial Limbs, National Research Council (covering the period, 4 April 1945 through 30 June 1947), pages 63–64 relied upon.

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ABSTRACT
The invention provides a cosmetic covering for the shin part of artificial legs made from two differently coned hollow plastics mouldings providing a facility for length variation.

4 Claims, 4 Drawing Figures
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LENGTH ADJUSTABLE COSMETIC LEG COVERING

BACKGROUND OF THE INVENTION

This invention concerns improvements in artificial legs, more particularly it concerns the visible part or cosmesis of the shin portions of such legs.

Virtually all modern artificial legs embody load-bearing structure of metal, such as light alloy, which is quite separate from the cosmesis and the latter (often made of plastics laminate) has little or no load-bearing function.

There is a growing tendency to employ a "modular" system of standardized elements in the construction of artificial limbs.

Elements, such as knee and ankle joints, have standard sizes and interlocking faces and are fitted with various forms of mechanical or hydraulic controls and other operative parts to suit the requirements of individual patients.

Among such elements are various standardized forms of shin members of pre-determined or adjustable length.

It is with the economical, hygienic and visually attractive covering of standardized shin elements of varying lengths that the invention is principally concerned.

SUMMARY OF THE INVENTION

According to the invention, a cosmetic covering for an artificial leg shin member comprises two parts, an upper part moulded from compliant plastics material whose interior is shaped so as to slide over and locate against external surfaces of the member and a lower part in the form of a thin generally tubular laminated shell, the outer surface of the said upper part being tapered over a given length at its lower end at a given angle and the inner surface of the said lower part being tapered over a given length at its upper end at a lesser angle, whereby the lower part may be force-fitted over the compliant upper part and the total length of the inter-fitted parts may be shortened from its maximum by removal of a length of material from the upper end of the lower part before force-fitting.

The expression "tapered" used in the above clause is not intended to imply strict conicity, in practice a gently curved contour is given to the parts to improve the aesthetic appearance; in this context the word "angle" is intended to express a general reduction in circumference from higher to lower regions of a part.

In preferred forms of the invention the interior of the top of the upper part is reinforced with a standard pre-shaped glass laminate providing relatively hard surfaces for mating with metal elements of the shin member.

The interior of the upper part may also be recessed over given areas to leave only a thin exterior skin, which may be slit to give access to adjustable elements of the shin member.

Also in preferred forms of the invention the lower or distal end of the lower part is shaped to fit over and locate over an ankle or foot member.

Before force-fitting the entire periphery of the lower part over the upper part, the interior surface of the upper end of the former should be gently relieved or tapered so as to avoid the formation of an unsightly bulge in the compliant surface of the latter.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic centrally sectioned view of an assembled shin cosmesis adjusted for maximum length;

FIG. 2 is a similar elevational view of the cosmesis of FIG. 1 adjusted for minimum length;

FIG. 3 is a detailed section of the cosmesis of FIGS. 1 and 2 in a plane at right angles to that of FIG. 1, and FIG. 4 is a perspective plan view of the cosmesis of FIG. 3.

DETAILED DESCRIPTION OF THE DRAWING

From FIG. 1 it can be seen that the lower end of the upper part 1 of the cosmesis is tapered from a circumference A to a circumference B over the length L, whereas the upper, or proximal portion of the lower part 2 is tapered from circumference A to circumference B over the length L + X. In other words, the outer surface of the upper part has an increasing taper over length L, while the inner surface of the lower part has a lesser increasing taper over the longer length L + X.

Knee and ankle centres are designated O and P respectively in both FIGS. 1 and 2.

In FIG. 1 the inter-fitted parts 1 and 2 give the maximum knee to ankle centre length, whereas in FIG. 2 a length X has been trimmed away from the upper end of the lower part 2 and the distance between centres has been shortened to that extent.

It will be appreciated that trimming away shorter lengths than X from the lower part 2 makes possible the obtainment of a total length of anything between maximum and minimum.

The lower part can be marked or graduated to indicate the level of cut for a particular length of shin, and it will be appreciated that because the tapered sections are not linear, the graduations will not necessarily be equally spaced.

Fixing or sticking together of the two parts is not required since both are securely held by underlying structure, as shown in FIGS. 3 and 4 in connection with the upper part 1; similar structure at the ankle joint retains the lower parts.

In FIGS. 3 and 4 it can be seen that the upper part 1 of the cosmesis incorporates a pre-shaped glass laminate liner 3, which includes vertical faces such as 4 and 5 which abut complementary faces of the upper end fitting 6 of a tubular metal shin member 7.

The upper part 1 of the cosmesis also incorporates horizontal faces such as 8 and 9 (FIG. 4) which locate against horizontal faces of the end fitting 6.

As above mentioned, the lower part 2 also includes vertical and horizontal faces (preferably incorporated in a relatively stiff glass laminate), which locate against elements of an ankle fitting.

As an end result, it is a straightforward process to slide an upper cosmesis part 1 up and over a standard modular shin member 7 until faces such as 8 and 9 give a positive stop. Thereafter the upper "tapered" end of the part 2 can be trimmed away until lower shin member parts achieve a similar positive location of the cosmesis for any desired knee to ankle centre length.

A variation in shin length of 2 ¼ inches accommodates the requirements of 90% of patients and this is easily provided for in the cosmesis of the invention.

It will be appreciated that a small stock of standardized upper and lower parts of varying stoutness will
meet the requirements of the majority of patients, male or female.

I claim:

1. A cosmetic covering for an artificial leg shin member comprising two parts, an upper part molded from compliant plastics material whose interior is shaped to slide over and locate against external surfaces of the member, and a lower part in the form of a thin generally tubular laminated shell, the outer surface of the said upper part having an increasing taper over a given length at its lower end, and the inner surface of the said lower part having a lesser increasing taper over a longer given length at its upper end such that the entire upper periphery of said lower part engages with and is force-fitted over the compliant upper part whereby the total length of the inter-fitted parts may be adjusted and shortened from its maximum by removal of a length of material from the upper end of the lower part before force-fitting.

2. A cosmetic covering according to claim 1, wherein the interiors of the top of said upper part and the bottom of said lower part are reinforced with harder material to provide abutment surfaces for complementary metal surfaces of a covered shin member.

3. A cosmetic covering according to claim 2, in which the reinforcements are standard pre-shaped glass laminates about which the compliant plastics material is moulded.

4. A cosmetic covering according to claim 1 in which the lower part is marked with graduations indicating cutting level for a given total length.