No. 703,156. Patented June 24, 1902

M. SMITH.

ARTIFICIAL FOOT.

(Application filed Sept. 24, 1901.)

(No Model.)

FIG. 1.

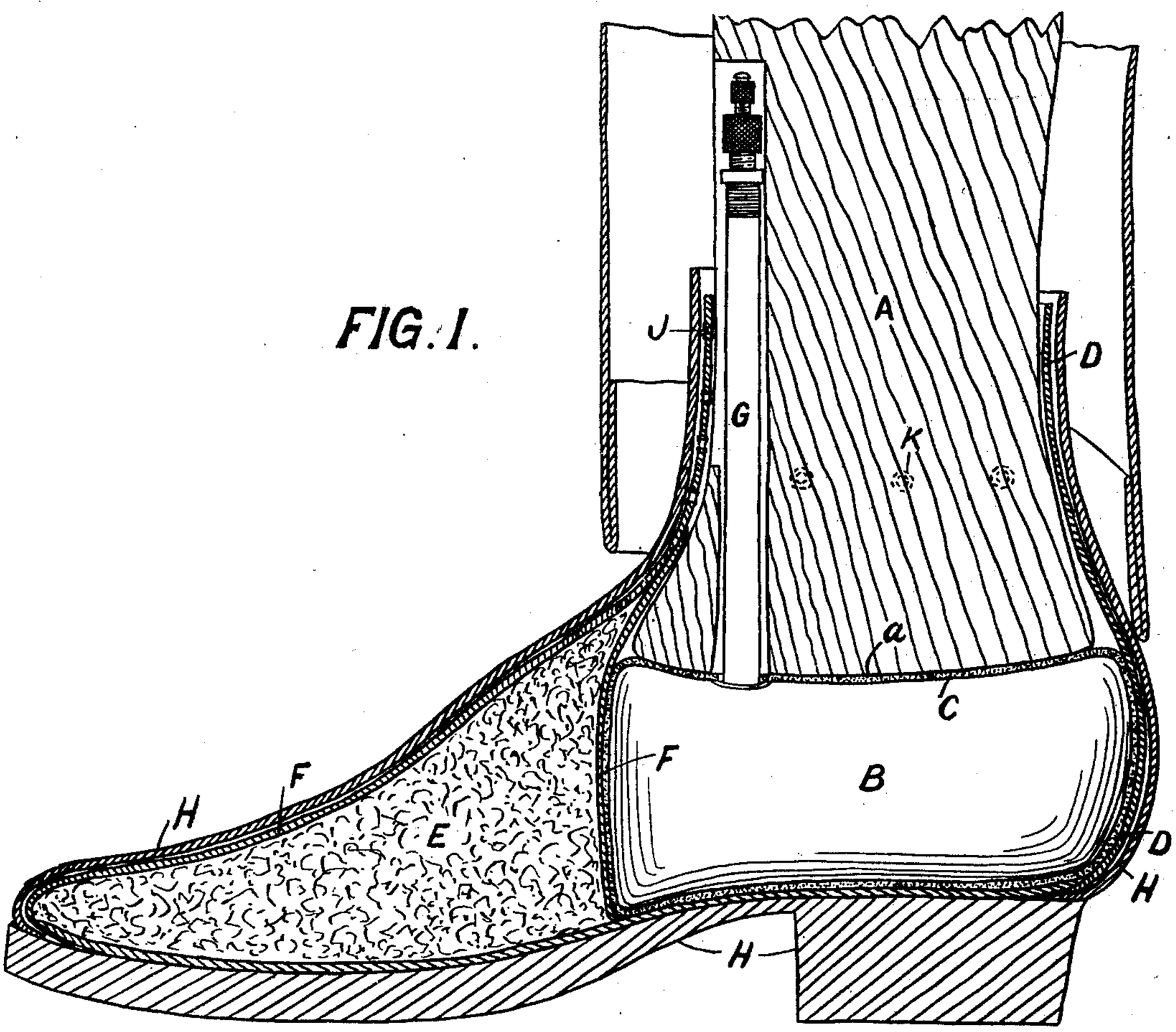
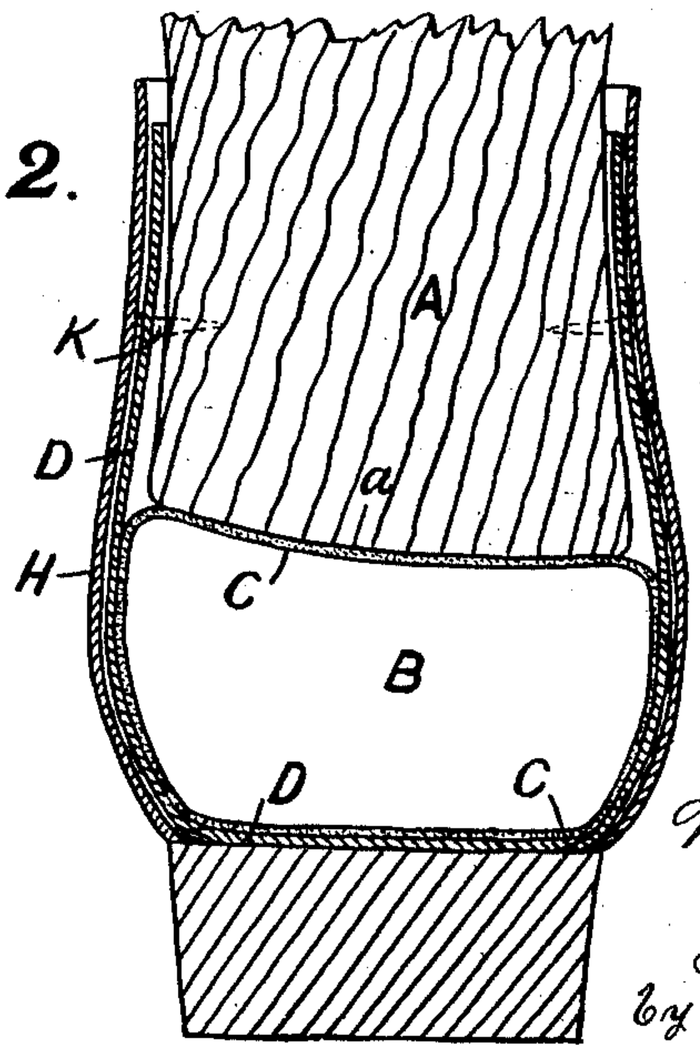


FIG. 2.



Witnesses

T. W. Wiman

Peter A. Ross

Inventor

Matthew Smith

by Henry Connett

Attorney

UNITED STATES PATENT OFFICE.

MATTHEW SMITH, OF LIVERPOOL, ENGLAND, ASSIGNOR OF ONE-HALF TO EDWARD HENRY WALKER, OF BOOTLE, COUNTY OF LANCASTER, ENGLAND.

ARTIFICIAL FOOT.

SPECIFICATION forming part of Letters Patent No. 703,156, dated June 24, 1902.

Application filed September 24, 1901. Serial No. 76,341. (No model.)

To all whom it may concern:

Be it known that I, MATTHEW SMITH, a subject of the King of Great Britain, residing at 4 Arthur street, Seaforth, Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Artificial Feet, (for which application has been made in Great Britain, under No. 14,894, and dated July 22, 1901,) of which the following is a specification.

This invention has for its object an artificial foot and embodies certain improvements which will now be described.

In the accompanying drawings, Figure 1 is a longitudinal section of my artificial foot; Fig. 2, a cross-section.

The lower part of the leg A, including a small portion of the top of the foot, is made of light wood and is of suitable length to attach to the artificial foot. This wooden part rests on a pneumatic cushion B, formed by an india-rubber or other like bladder, in a casing C, of leather or any other suitable material. The above parts, together with the lower portion of the wooden part, are laced at J and screwed at K or otherwise incased in a leather cover or boot D, thus forming the ankle and foot from the heel to the instep, the sole of the above covering or boot being pliable and cut to the form of the human foot. The part E of the foot from the toes to the instep is made of granulated cork or like resilient material, also incased in leather and is fastened onto the continuation of the aforesaid sole not occupied by the heel part. This toe portion can, if desired, be hinged to the front part, so that it can be flexed in the act of walking. The ankle-joint has in some constructions heretofore consisted of the socket or axial bolt in the foot, and little or no provision is made for absorbing vibration. By this invention, however, the air-cushion B removes this difficulty, as it provides both resilience and freedom of motion in every direction within certain defined limits, like a universal joint, and effects a very considerable reduction in weight.

The wooden part A, comprising the ankle and a small portion of the foot, is of same shape as that of the human limb, narrowing toward the bottom of the ankle and then slightly spreading out to form a portion of the top of the foot and heel. The under surface *a* of this part or that resting on the pneumatic cushion is of convex section from front to back, allowing of easy and efficient ankle action, and as the lowest point of the convex surface comes in or near the middle it tends to bulge out the ends of the pneumatic cushion B, thus getting full advantage of the resiliency of the cushion, and as the surface in question is of less area than that of the cushion there is less wear, owing to the absence of creasing of the cushion while it is being walked on, which would take place were the surface to overlap the cushion. This arrangement also allows certain liberty of ankle action or forward and backward rocking movement, which takes the place of the ankle-joint of the natural leg. Another feature in connection with this wooden ankle portion is that the underneath surface *a*, as well as being convex from front to back, slants downward from the outside to the inside, there being a difference of perhaps three-quarters of an inch between the two edges, thus to a large extent obviating the tendency of the foot to turn over outward when its owner is walking over sand or soft ground. Through the bottom of this wooden portion A there is a vertical hole ending in a groove in the fore part of the ankle, through which a tube G or suitable valve connection can be brought from the bladder part B of the pneumatic cushion, so that this bladder can be easily inflated without any portion of the foot having to be unfastened, the upper end of the tube normally lying inside the groove. The part E of the foot from the toes to the instep is brought to bear right up against the heel part and being formed of granulated cork or the like incased in leather or other covering F and fastened onto a pliable sole affords ample toe action. The artificial foot thus formed will fit any ordinary kind of boot, such as H, which will thus have exactly the same appearance as if there were a natural and not an artificial foot inside of it. If necessary, the toe portion of the artificial foot can be dispensed with, in which case the toe of the ordinary boot would have

to be blocked up with cork or like resilient material.

I declare that what I claim is—

1. In an artificial limb, the combination with an artificial leg having an ankle portion at its lower end, of a boot, the top of which embraces said ankle portion of the leg, an air-cushion under the said leg and forming the heel portion of the foot, and the part forming the front portion of the foot, said front portion abutting against said cushion, and the said front portion and heel portion being inclosed within said boot, substantially as set forth.

2. In an artificial limb, the combination with the artificial leg having a convex lower end from front to rear, a cushion under the lower end of said leg and forming the heel portion only of the foot, the front portion of the foot abutting at the rear against said cushion, and means for connecting said parts together, substantially as and for the purpose set forth.

3. In an artificial foot and in combination, the pneumatic cushion and artificial leg having its basal surface that rests against said cushion slanting downward transversely from the outside to the inside, substantially as and for the purpose described.

In witness whereof I have hereunto signed my name, this 7th day of September, 1901, in the presence of two subscribing witnesses.

MATTHEW SMITH.

Witnesses:

G. C. DYMOND,

ALBERT C. B. HENRI.