Translation and Abstract Service

Two additional translations of foreign orthopedic and prosthetic articles appear in this issue of the *Orthopedic and Prostheitc Appliance Journal.*

This translating and abstract service for members and other readers of the *Journal* was authorized by the Directors of the American Orthotics and Prosthetics Association in November, 1965. It provides for summaries of articles from medical periodicals as well as translations. The cooperation of members of the committee makes possible the continuation of this service.

Hip Joint with Automatically Activated Stop for the Hip-Disarticulated Amputee*

Research Laboratory Report from Orthopaedic University Clinic, Muenster, Germany

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Research by STEFAN BURGER, *conducted with support of Federal Ministry for Labor and Social Affairs*

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We reported on the rehabilitation of a polio patient in issue No. 6 of *Orthopaedie Technik.* The stop of the hip joint of this non-conventional design prosthesis stimulated our interest in developing this design to a point where it could be prefabricated.

A hip-disarticulation prosthesis with support of the socket by a movable bar was first fabricated by Mr. Schroder of Bad Pyrmont. His design features attachment of the bar within the knee joint, which is constructed by utilizing prefabricated knee units. The application of this design can be either more, or less difficult—depending upon the type of knee unit.

It was our intention to develop a hip joint which could be readily used

* Translated and reprinted with the permission of the author and publisher from *Orthopaedie-Technik*, Wiesbaden, Germany, January 1965, pp. 13-14.

with the various types of knee designs, and which allowed for all necessary changes during the fitting process. These adjustment possibilities should exist at any level above-the-knee joint, as well as between hip joint and pelvic socket. The U.S.A. has a hip joint for hip disarticulations which is commercially available. This joint consists of two side bars, an axis with bushings, and a housing with attachment lugs for attaching the joint to the socket. (Illustration No. 1).

The following description represents a combination of these two joint designs. The stop is new and, we believe, improved. This stop is controlled from the socket by the utilization of a cam.

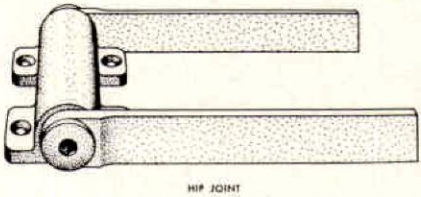

FIGURE 1—U.S.A.-made Hip Disarticulation Joint

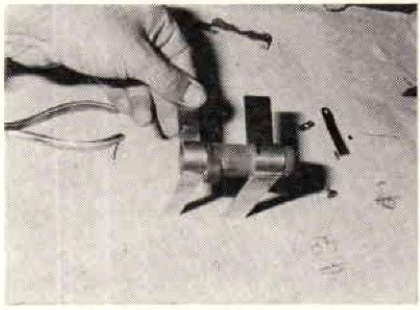

FIGURE 2—Hip Joint Bushing with Guidance Cam and Attachment Lugs

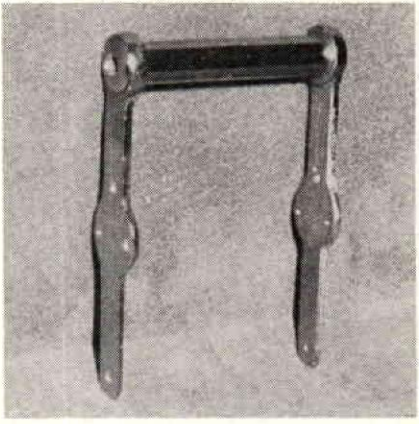

FIGURE 3—Hip Joint Axis (16MM Standard Axis)

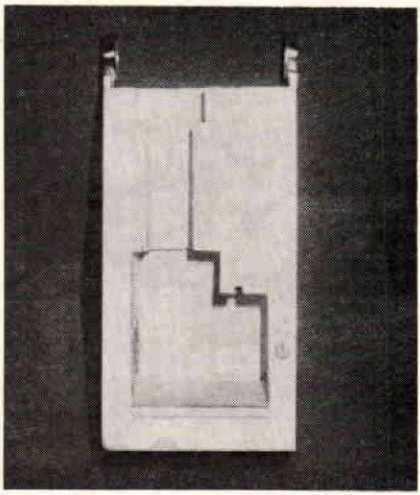

FIGURE 4—Thigh Section Made of Poplar Wood

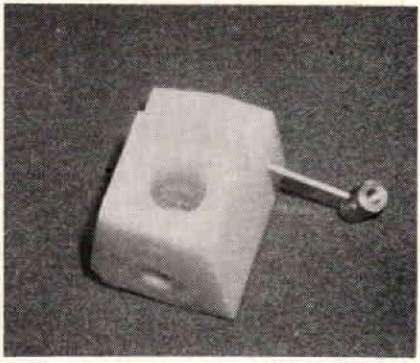

FIGURE 5—Extension Stop Made of Plastic

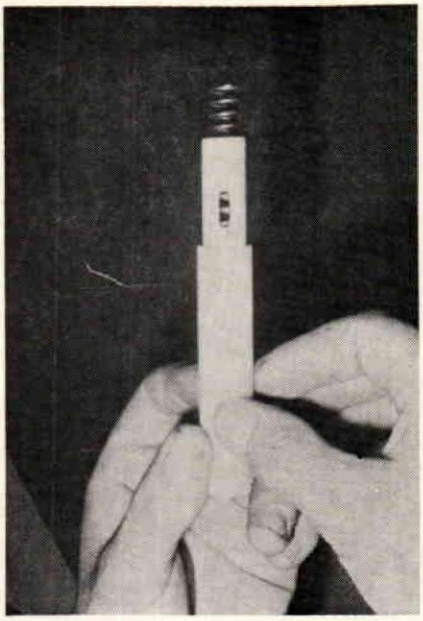

FIGURE 6—Stop Tube Made of Plastic

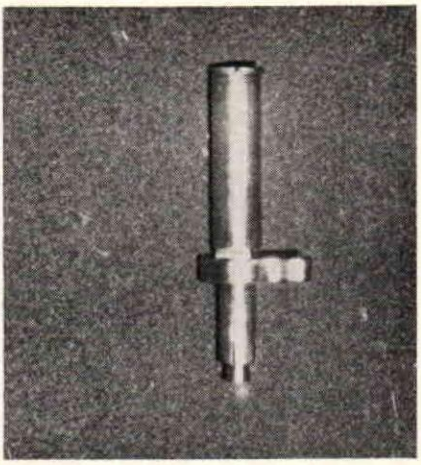

FIGURE 7—Axis of Extension Stop with Guidance Cam for Telescope

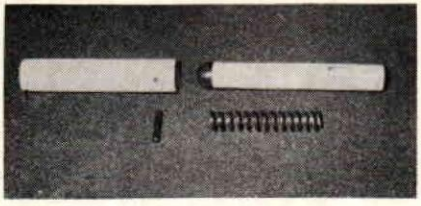

FIGURE 8—Guidance Cam with Retriever Spring

Basically, the joint consists of:

A. The hip joint bushing with guidance cam and attachment lugs (Illustration No. 2)

B. The joint axis (16 mm. standard axis) (Illustration No. 3)

C. Attachment bars (standard bars for knee set-up) (Illustration No. 3)

D. Thigh section, made of poplar wood (Illustration No. 4)

E. Extension stop made of plastic (Illustration No. 5)

F. Stop tube made of plastic (Illustration No. 6)

G. Axis of extension stop with guidance cam for the telescope (Illustration No. 7)

H. Guidance lever with retriever spring (Illustration No. 8)

We attached the axis far anteriorly, and close to the anatomical axis of the hip joint, in the desire to keep the thigh section as low and as flat as possible for the greatest comfort in sitting. (Illustration No. 9)

This arrangement foreshortens the stop tube even with minimal hip-flexion, and thereby does not support the pelvic socket any longer. In order to maintain the stop tube at equal length at every hip-flexion position, a telescopic construction was utilized. The telescope elongates through the action of a cam, and is retrieved by the pressure of a spring, using the same principle as used in the extension stop. The arrangement of controlled guidance makes failing of the stop impossible. The stop will function even if the spring is broken. In case this should happen the function of the spring would be replaced by the seat of the chair. The stop tube has a rubber

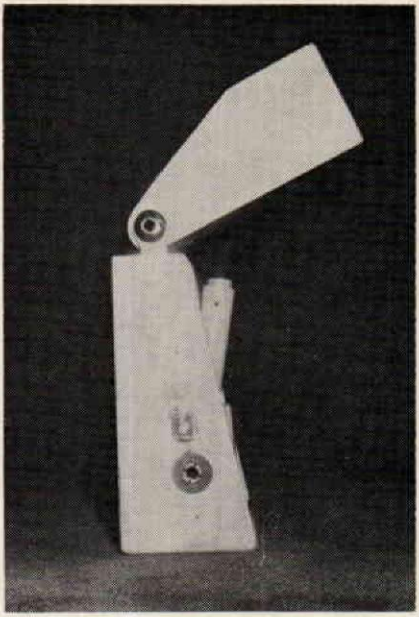

FIGURE 9

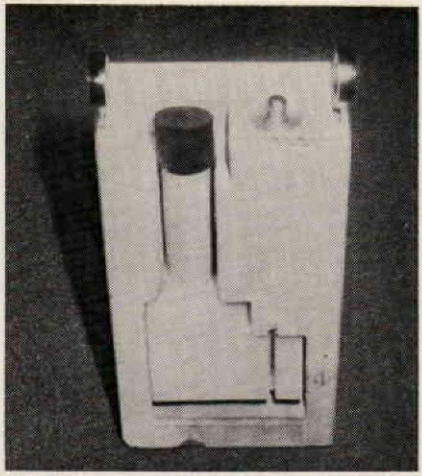

FIGURE 10—Thigh Section With Guidance Vector

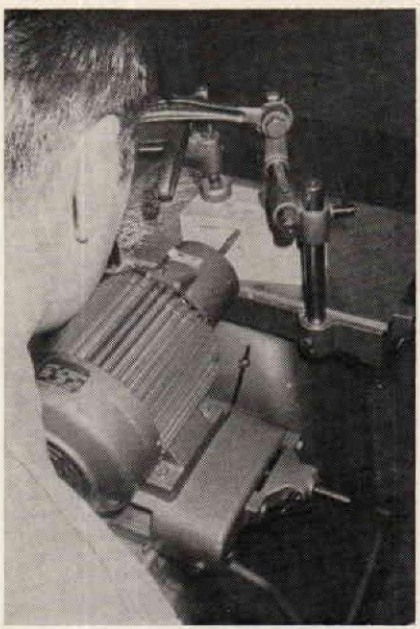

FIGURE 11—Turning of the Thigh Section on the Lathe

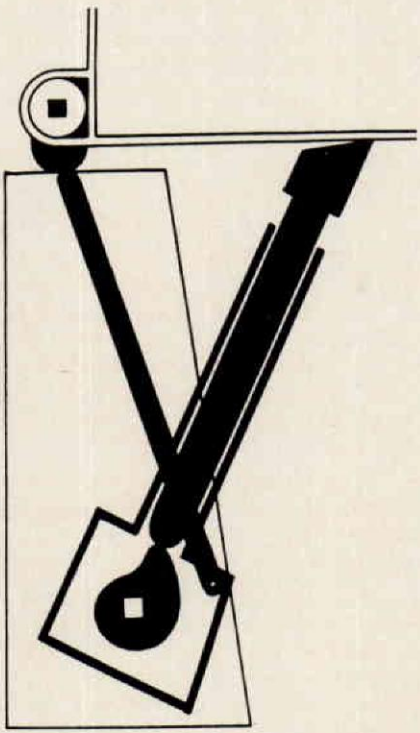

FIGURE 12A—Position During Standing

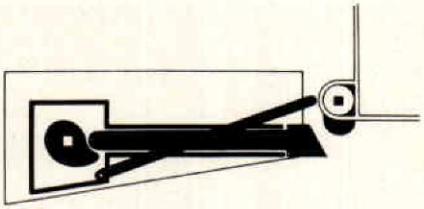

FIGURE 12B—Position During Sitting

Description of the Function

bumper on its proximal end. This bumper has been tapered and functions as a preliminary stop.

The cam which is attached to the hip joint bushing is pressing on the guidance slide during standing.

The guidance slide in return pivots the stop section around the fixed axis.

This results in moving of the telescope, which is located inside of the top tube, towards the socket.

The motion is activated by the cam which is attached to the axis. (Illustration No. 12A)

The hip joint is now supported and the load lines are in correct axial alignment.

The guidance slide is released during sitting.

The retriever spring presses in the direction of the hip jont and reversing of the above described action is taking place. (Illustration No. 12B)

The pictures illustrate the technical details of the design.

A sample construction is available to any manufacturer for guidance in commercial fabrication.