A workbench includes two opposite sides each having a connection member mounted thereon. Four stationary members respectively mounted to two opposite ends of each of the two connection members. Four sleeves respectively mounted to two opposite ends of each of the two connection member and extending through the connection member and the stationary member. Four legs respectively inserted into a corresponding one of the four sleeves for supporting the top of the workbench.
WORKBENCH WITH FOUR DETACHABLE LEGS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a Continuation application of Ser. No. 11/372,016, filed Mar. 10, 2006, and entitled “CONNECTION DEVICE FOR CONNECTING LEGS TO TOP OF WORKBENCH”, now pending.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a workbench, and more particularly to a workbench with four legs that can be easily detached from the workbench when needed.

[0004] 2. Description of Related Art

[0005] A conventional workbench generally includes a top and four legs which are connected to the underside of the top by four connection devices respectively. Each of the connection devices includes a connection member which includes a frame and a first tube is connected to the frame. The frame is connected to the bench and the tube and includes a tapered inner periphery. Each frame receives a stationary member which includes a second tube which includes a tapered periphery. A sleeve with tapered outer periphery is engaged with the first and second tube so that the sleeve can be securely engaged with the tapered inner peripheries of the first and second legs. Each leg has an end engaged with the sleeve so as to be connected to the top of the workbench. However, either the first tube and sleeve lacks a proper stop mechanism to maintain the relative positions between these parts so that when a heavy load is put on the workbench, the sleeve and/or the leg moves towards the top of the workbench and is stock with each other. This situation might break the sleeves and the legs are difficult to be disengaged from the top when the workbench needs to reduce its size for convenience of transportation.

[0006] As regard to U.S. Pat. No. 6,659,410 of Lu that discloses a leg of a metallic table, the reference numbers hereinafter relative to the original specification of Lu, Lu discloses that his invention includes a connecting portion 11 and an elongated supporting portion. The connecting portion 11 includes a support 112 and a connecting unit 113. The support 112 includes a first through hole 1122 and a first annular wall 1123 formed around the first through hole 1122. The connecting unit 113 has a second through hole 1131, which is aligned with the first through hole 1122. A second annular wall 1132 is formed around the second through hole 1131. The elongated supporting portion 12 has an annular trench 121 on an upper end thereof. Two pads are fitted onto the upper end of the elongated supporting portion 12. Each of pads 13 has a protruding line 131 on an inner side thereof, which is fitted into the elongated supporting portion 12.

[0007] Viewing the connecting relationship disclosed by Lu, there is no stopping structure provided among the first annular wall 1123, the second annular wall 1132 and the sleeve 13 such that the sleeve 13 may slowly moved toward the tabletop due to a heavy gravity from the tabletop after used for a period of time. As a result, the tapered outer periphery of the sleeve 13 securely abuts against the first annular wall 1123, the second annular wall 1132, and the inner periphery of the sleeve 13 securely abuts against the elongated supporting portion 12 such that the elongated supporting portion 12 with the sleeve 13 is difficultly detached from the support 112 and a connecting unit 113. It is inconvenient design.

[0008] The present invention intends to provide a connection device for connection legs to a top of the workbench, wherein the sleeve includes grooves in outer periphery thereof and the first and second tubes each have a flange which is engaged with the grooves. The sleeve further includes a lip in an inner periphery thereof and the legs include groove for receiving the lips. By this way, the first tube, the second tube, the sleeve and the leg can be maintained at their position.

SUMMARY OF THE INVENTION

[0009] The present invention relates to a workbench and the workbench comprises a top and four connection members which are fixed to an underside of the top. Each connection member has a first hole defined therethrough and a first tube extends from a top of the connection member and encloses the first hole. A first flange extends inward from a tapered inner periphery of each of the four first tubes.

[0010] Four stationary members are respectively fixed to a corresponding one of the four connection members and each stationary member has a second hole defined therethrough. A second tube extends from a top of each of the four stationary members and encloses the second hole. A second flange extends inward from a tapered inner periphery of each of the four second tubes. The second tubes are in alignment with the first tubes.

[0011] Four sleeves are engaged with the aligned first and second tubes respectively. Each of the four sleeves has a tapered outer periphery and a tapered inner periphery. Two first grooves are defined in the tapered outer periphery of each of the four sleeves and the first and second flanges are engaged with the two first grooves of each sleeve.

[0012] Four legs each has a tapered outer periphery which is engaged with respective on of the four tapered inner peripheries of the four sleeves.

[0013] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is an exploded view to show the workbench of the present invention;

[0015] FIG. 2 is a cross sectional view to show the connection member and the stationary member of the connection device of the present invention are connected to the top of the workbench;

[0016] FIG. 3 is a cross sectional view to show the leg inserted into the sleeve which is engaged with the aligned first and second tubes of the connection member and the stationary member;

[0017] FIG. 4 is a perspective view to show the connection device of the present invention; and

DETAILED DESCRIPTION OF THE INVENTION

[0018] Referring to FIGS. 1 to 4, the workbench of the present invention comprises a top 1 which includes two side walls 2 respectively extending downward from two opposite sides thereof and each side wall 2 has a vertical portion and a horizontal portion. Two longitudinal connection members 3
fixedly connected to the horizontal portions of the two side walls 2 on an underside of the top 1. Each connection member 3 has two opposite ends each having a first hole 31 defined therethrough, and two first tubes 32 extending from a top of the connection member 3. Each first tube 32 encloses a corresponding one of the two first holes 31. A first flange 33 extends inward from an open top of a tapered inner periphery of each of the first tubes 32.

[0019] Four stationary members 4 are fixed to two opposite ends of a corresponding one of the two connection members 3 respectively and each stationary member 4 has a second hole 41 defined therethrough. A second tube 42 extends from a top of each stationary member 4 and encloses the second hole 41. A second flange 43 extends inward from an open top of a tapered inner periphery of each of the second tubes 42. The taper slope of the second tube 42 is equal to that of a corresponding one of the four first tubes 32. In addition, the second tubes 42 are in alignment with the corresponding first tubes 32.

[0020] Four sleeves 5 are engaged with the aligned first and second tubes 32, 42 respectively, and each sleeve 5 has a tapered outer periphery and a vertical inner periphery. Two first grooves 52 are defined in the tapered outer periphery of each of the sleeves 5. The first and second flanges 33, 43 are respectively engaged with and received in a corresponding one of the two first grooves 52 of each sleeve 5 to prevent the sleeve 5 from overly extending toward the underside of the top 1. Four legs 6 each have a tubular structure which is engaged with respective one of the vertical inner periphery of a corresponding one of the four sleeves 5. Each sleeve 5 has two lips 53 extending inward from the vertical inner periphery thereof and each of the legs 6 has a plurality of second grooves 61 defined in an outer periphery thereof. The lips 53 of each of the sleeves 5 are received in corresponding two of the plurality of second grooves 61 in each of the legs 6 for holding the legs 6 in place and to supporting the top 1.

[0021] The sleeves 5 are made by flexible material so that the size of the legs 6 can be made slightly larger than an inner diameter of the sleeves 5 so that the sleeves 5 are slightly expanded when the legs 6 are inserted therein. The expansion of the sleeves 5 makes the flanges 33, 43 to be securely engaged with the first grooves 52. Because of the engagement between the first grooves 52 and the flanges 33, 43, the sleeves 5 do not overly moved toward the top 1 of the workbench even a heavy load is applied on the top 1. The legs 6 do not overly move toward the top 1 because of the engagement of the lips 53 and the second grooves 61. By the connections described above, the legs 6 can be easily separated or detached from the top 1 when needed.

[0022] While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

What is claimed is:

1. A workbench with four legs that are easily detached from the workbench after being used for a period of time, the workbench comprising:

   a top including two side walls respectively extending downward from two opposite sides thereof and each side wall having a vertical portion and a horizontal portion;
   two connection members respectively fixed to an underside of the top and connected to a corresponding one of the two horizontal portions, each connection member having two opposite ends each having a first hole defined therethrough, each connection member having two first tubes extending from a top thereof and enclosing a corresponding one of the two first holes, a first flange inward extending from a tapered inner periphery of each of the two first tubes;
   four stationary members respectively fixed to two opposite ends of each of the two connection members, each stationary member having a second hole defined therethrough, a second tube extending from a top of each of the four stationary members and enclosing the second hole, a second flange extending inward from a tapered inner periphery of each of the four second tubes, each second tube aligning with a corresponding one of the four first tubes;
   four sleeves respectively inserted into the aligned first and second tubes, each sleeve having a tapered outer periphery relative to the aligned first and second tubes and a vertical inner periphery, two first grooves defined in the tapered outer periphery of each of the sleeves, the first and second flanges respectively engaged with a corresponding one of two first grooves to prevent the sleeve from overly extending toward the underside of the top of the workbench, two lips inward extending from the vertical inner periphery of each of the four sleeves; and
   four legs respectively inserted into a corresponding one of the four sleeves, each leg having a plurality of second grooves defined in an outer periphery thereof, the plurality provided to receive the two lips of the corresponding sleeve to hold the leg in place for supporting the top of the workbench;

   whereby:
   the sleeves are made of flexible material so that the size of the legs can be made slightly larger than an inner diameter of the sleeves so that the sleeves are slightly expanded when the legs are inserted therein and the expansion of the sleeves makes the first and second flanges be securely engaged with the first grooves; and
   the sleeves do not overly move toward the top of the workbench even a heavy load is applied on the top due to the engagement among the first grooves, the first flange and the second flange, and the legs do not overly move toward the top of the workbench due to the engagement of the lips and the second grooves such that the legs can be easily separated/detached from the sleeves when needed.