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(54) **PORTABLE CAMERA DOLLY AND TRACK**

(57)

ABSTRACT

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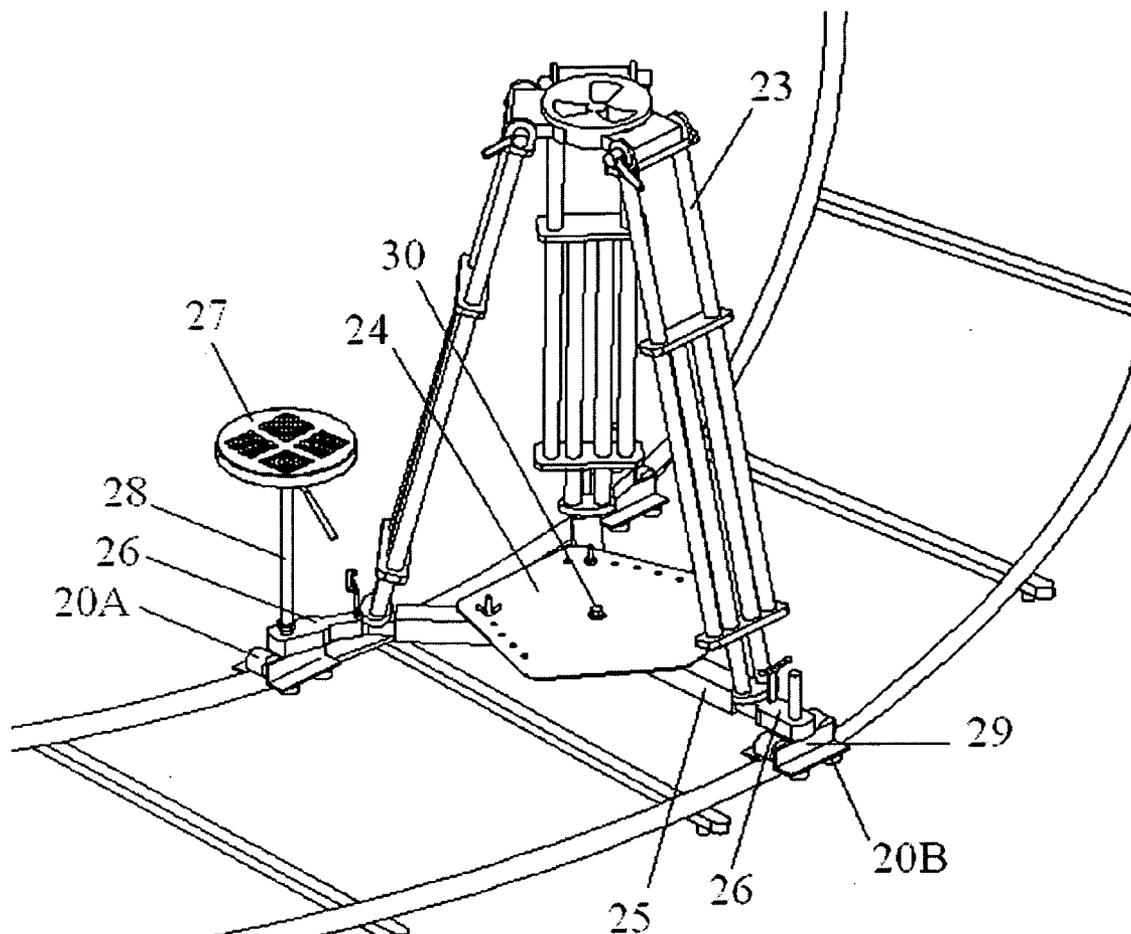
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The present invention discloses a portable, collapsible, and width-adjustable dolly and track system for movably supporting a cameraman and a tripod with a camera mounted thereon. The track system comprises a plurality of track sections, straight or curved, interconnected together to form either a straight track or a curved track. Each track section comprises a pair of parallel rails and two connecting members pivotally connecting the parallel rails. The track sections are pivotally operable for adjusting their width. The first embodiment of the dolly mainly includes two bars detachably connected in a T-shaped configuration. The second embodiment of the dolly mainly includes a plurality of inner and outer arms detachably connected together. The two embodiments of the dollies include a plurality of mounting points, wherein any of them are selectable to detachably assemble the dolly for achieving different widths.



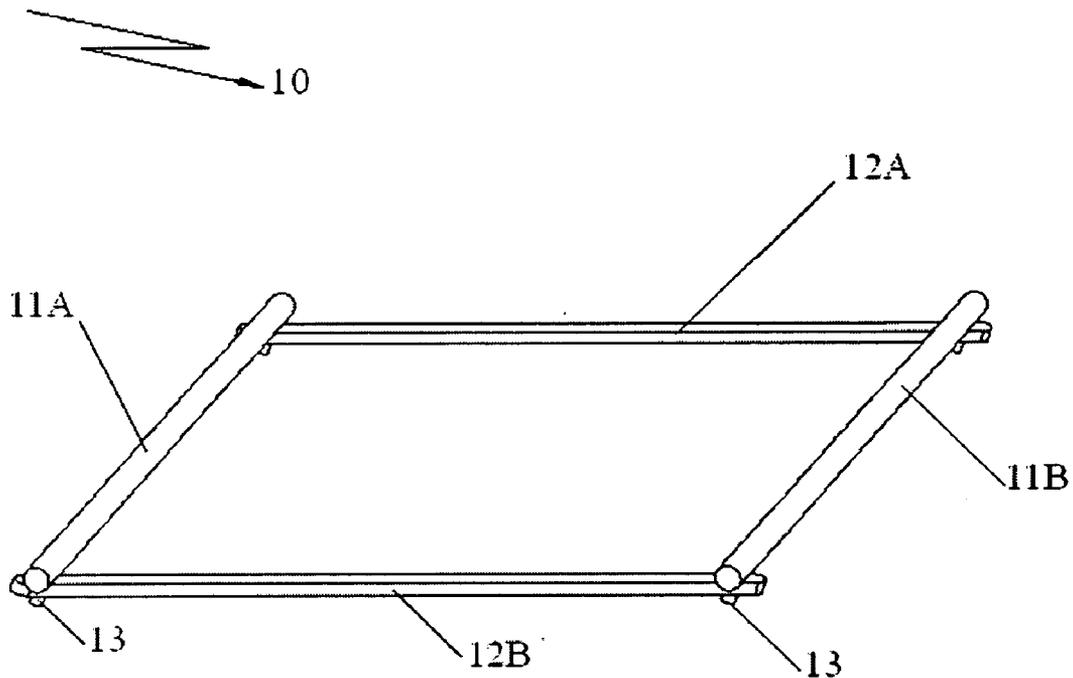


FIG. 1

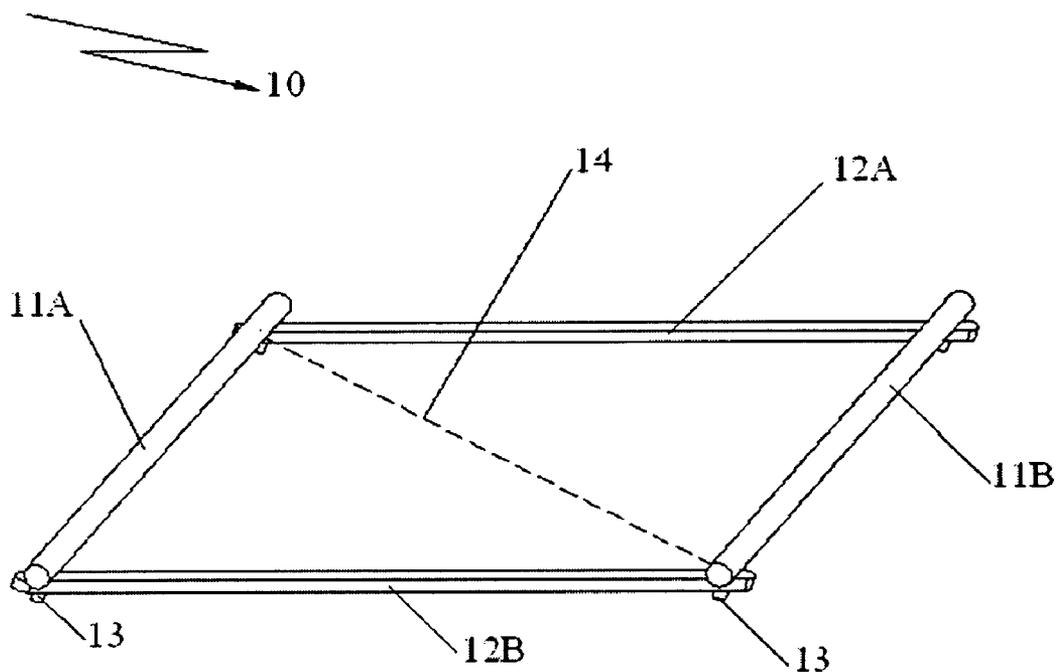


FIG. 2A

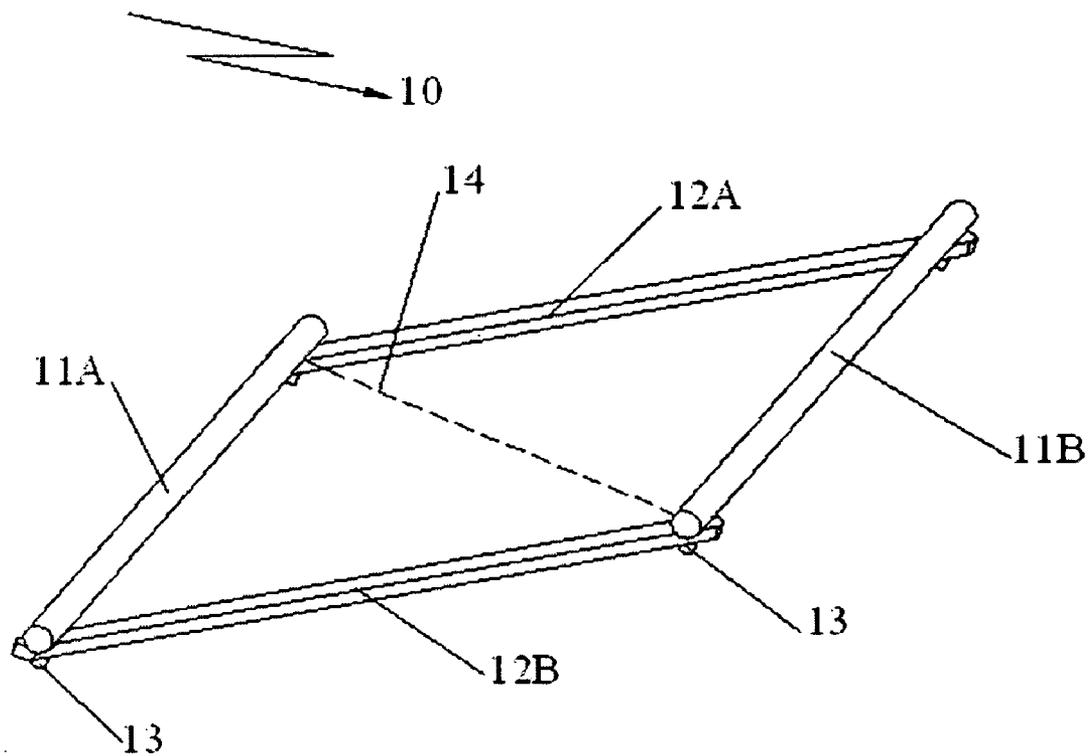


FIG. 2B

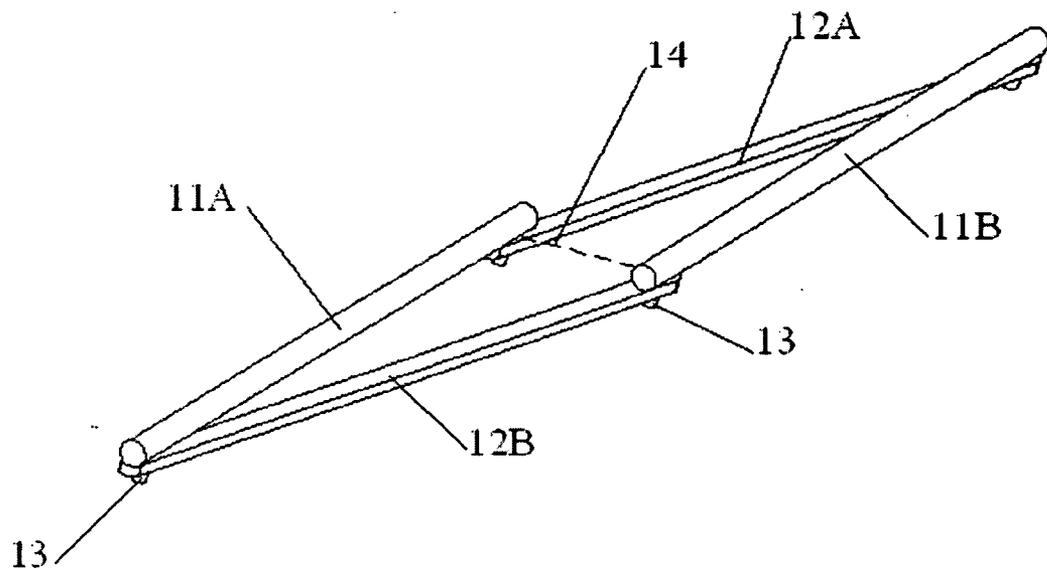


FIG. 2C

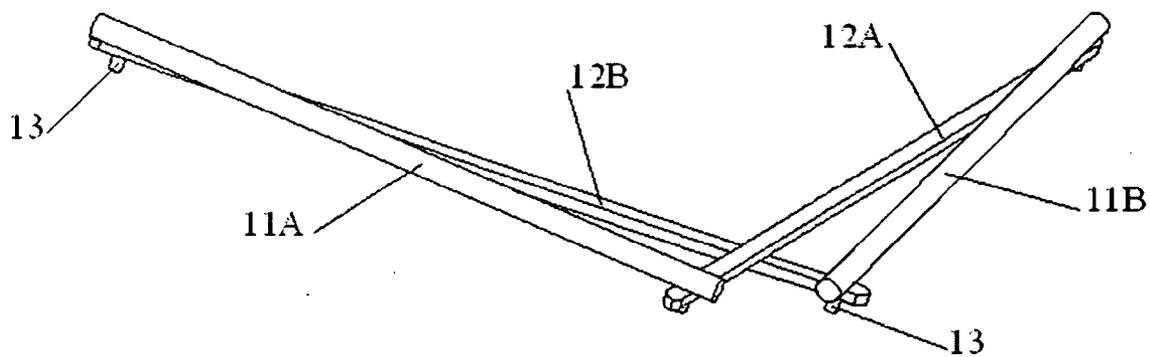


FIG. 2D

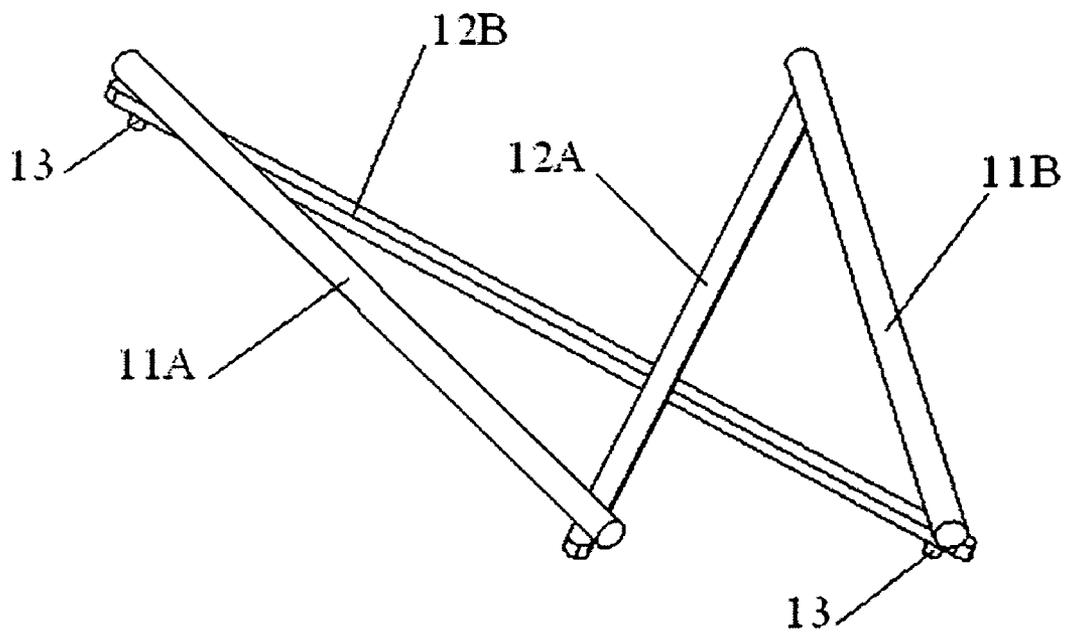


FIG. 2E

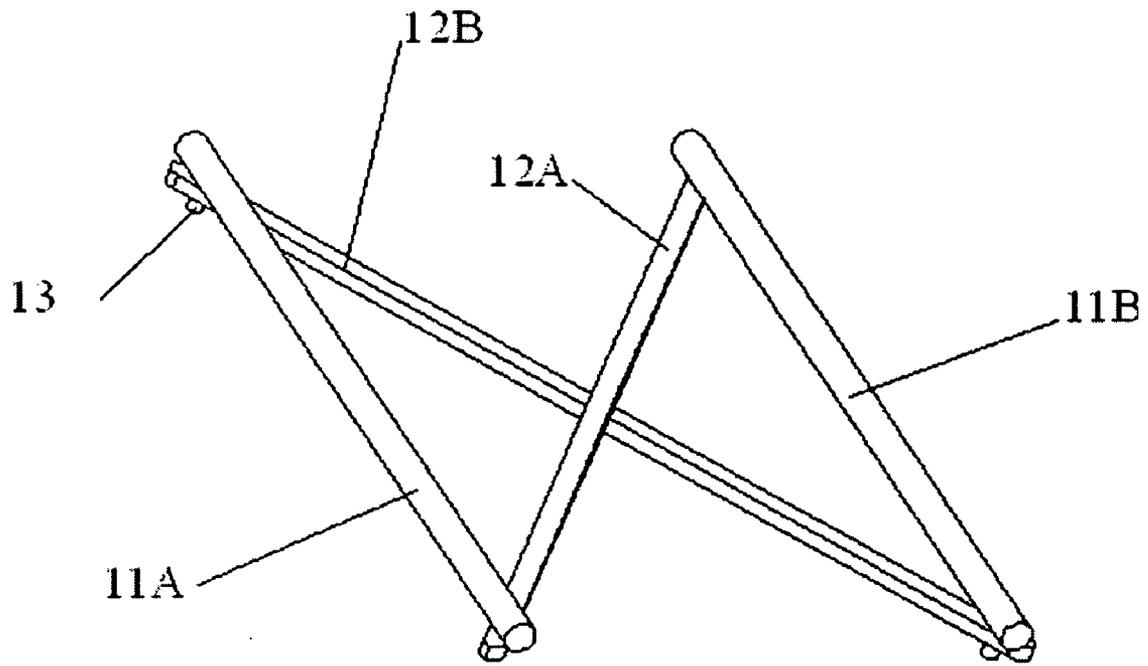


FIG. 2F

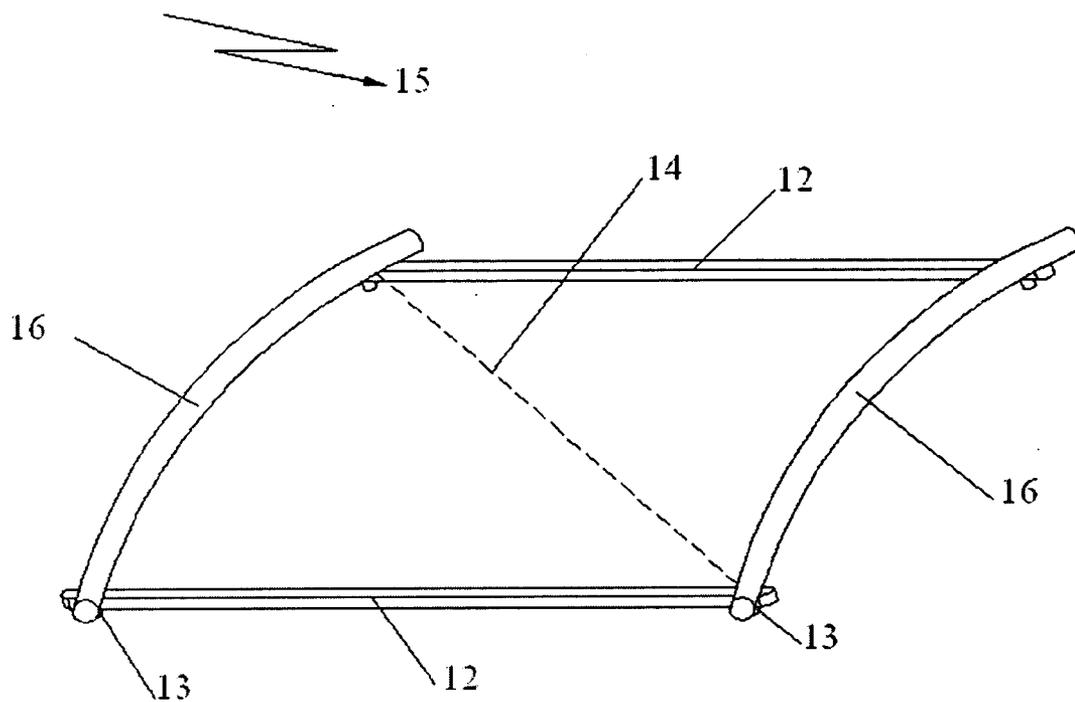


FIG. 3

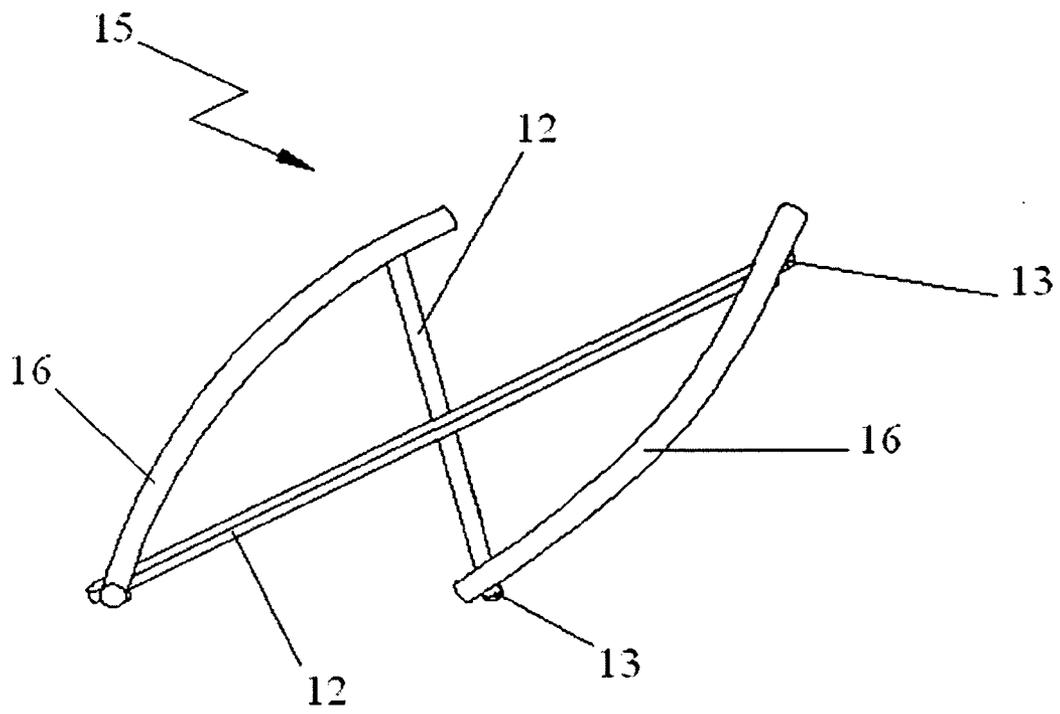


FIG. 4

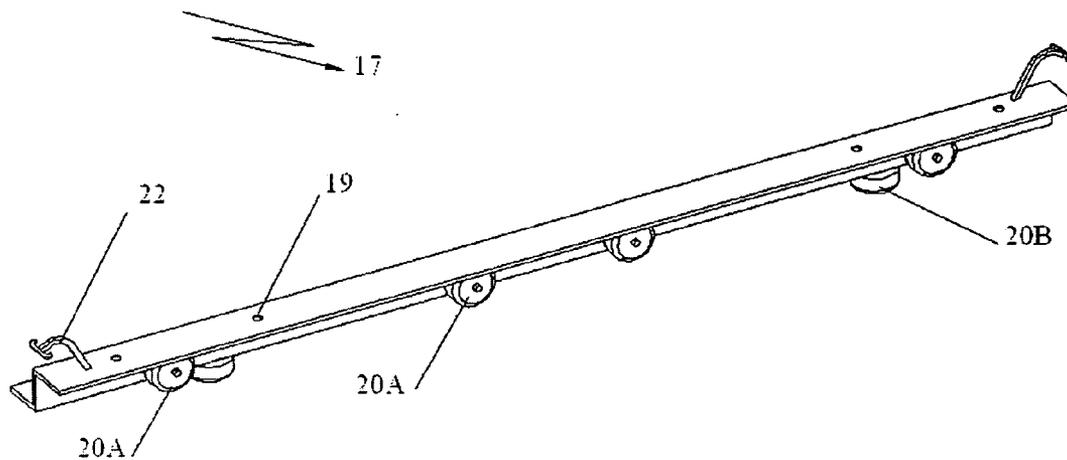


FIG. 5

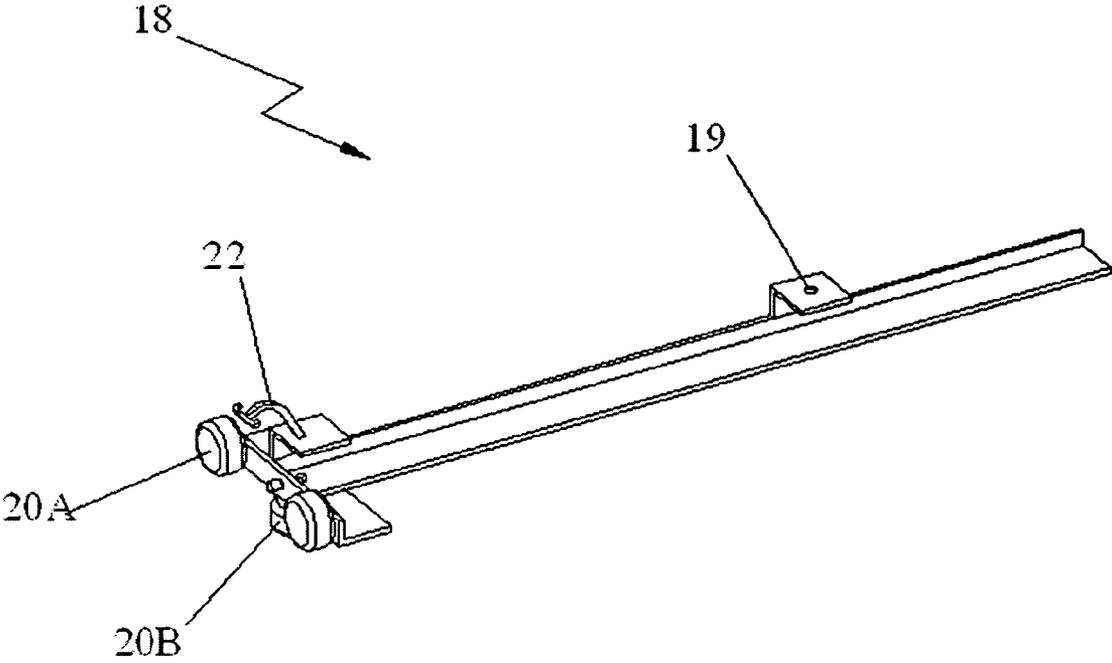


FIG. 6

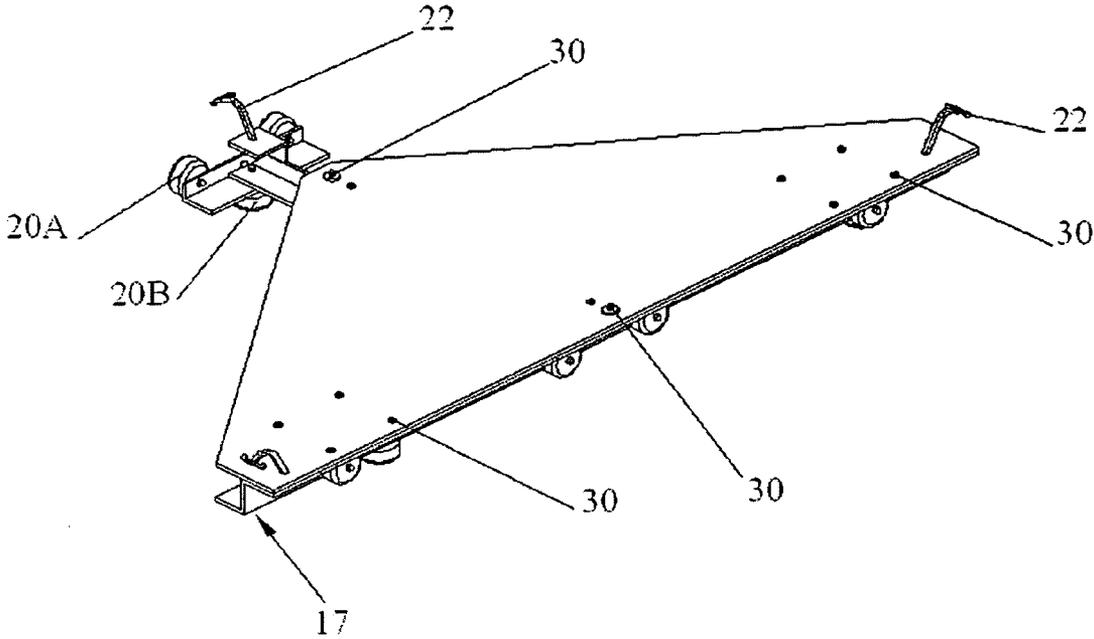


FIG. 8

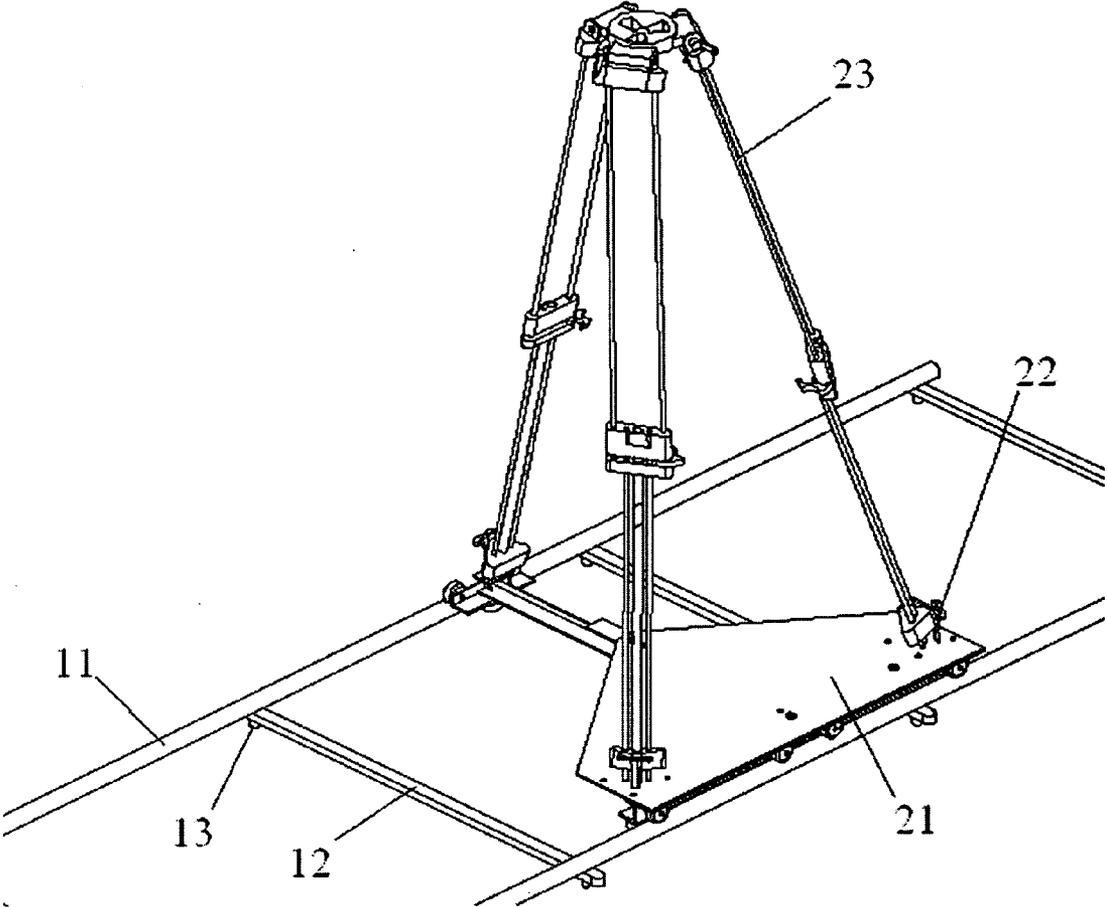


FIG. 9

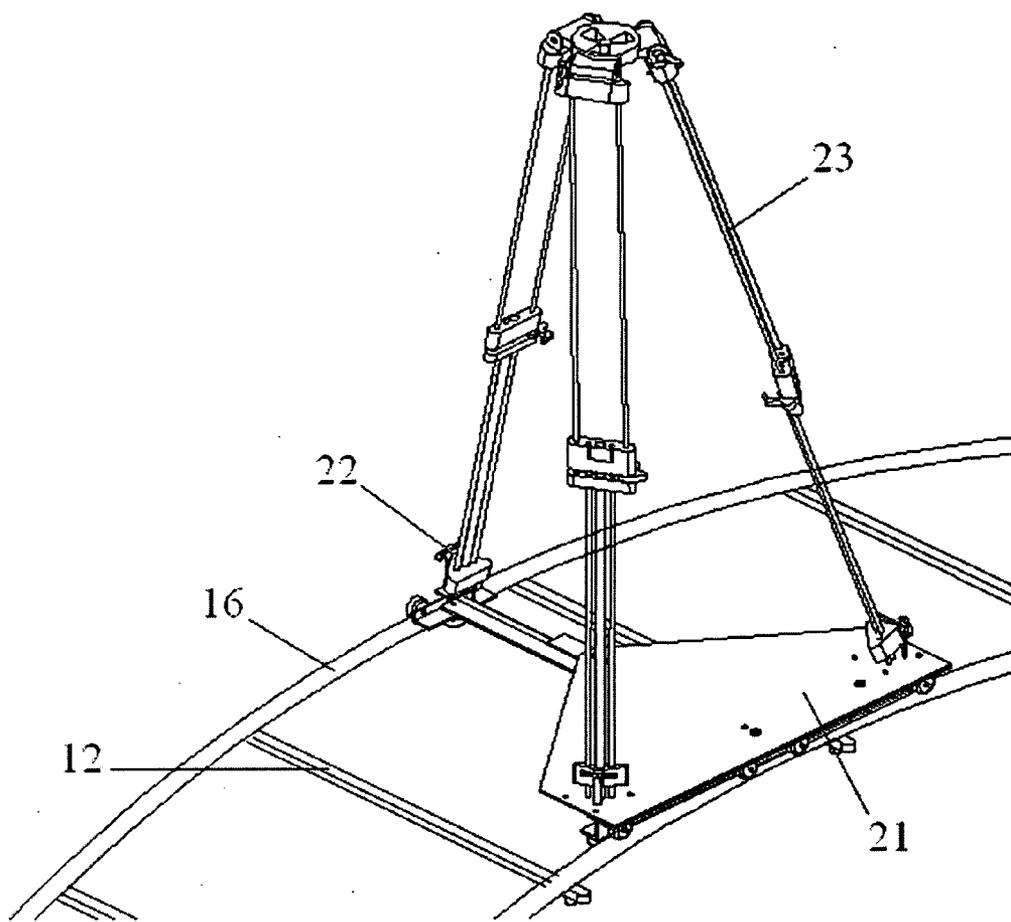


FIG. 10

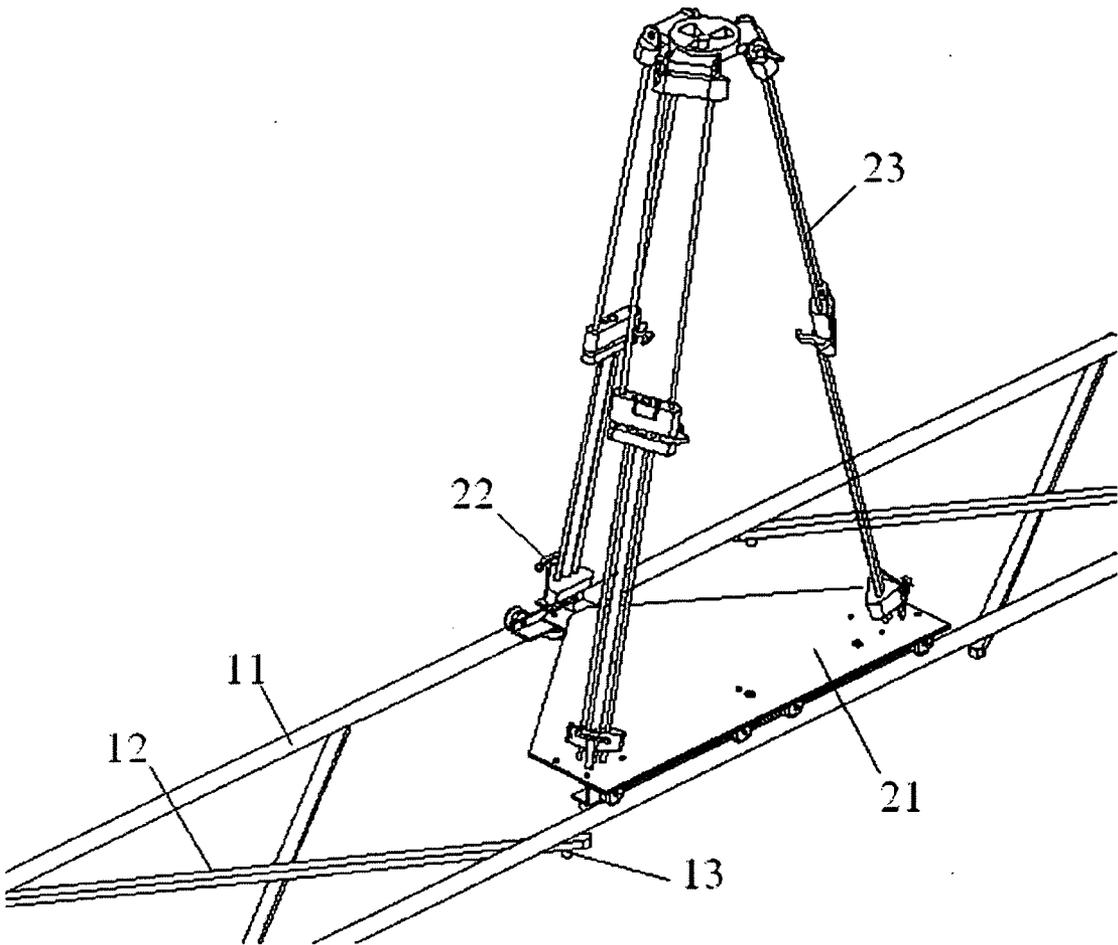


FIG. 11

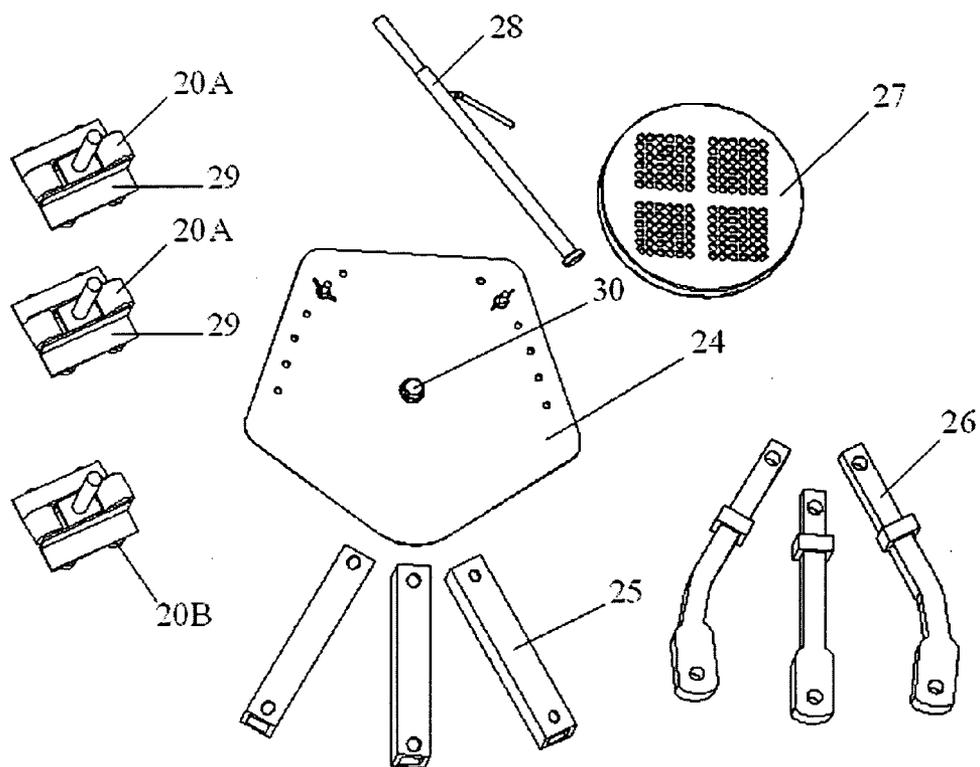


FIG. 12

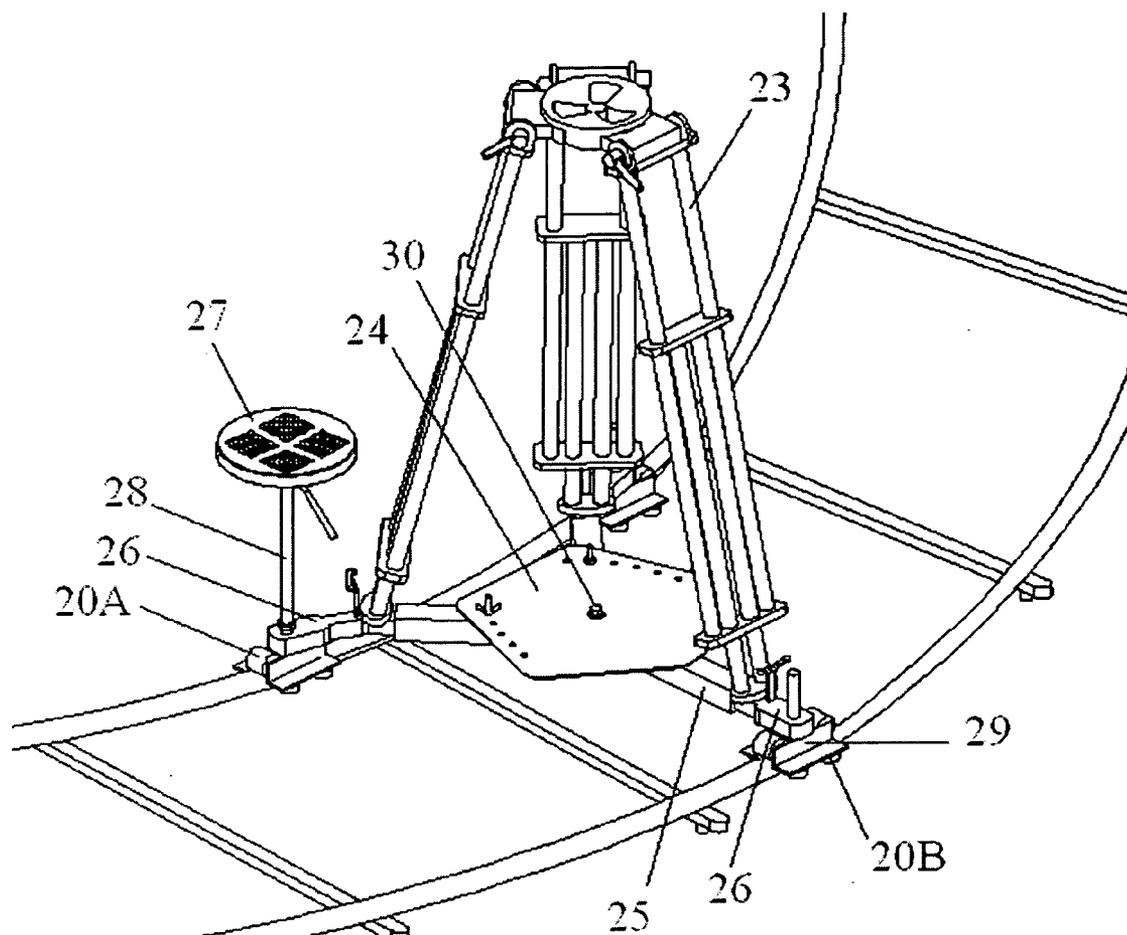


FIG. 13

PORTABLE CAMERA DOLLY AND TRACK

CROSS-REFERENCE TO RELATED APPLICATION

[0001] None

FEDERALLY SPONSORED RESEARCH

[0002] Not Applicable

SEQUENCE LISTING OR PROGRAM

[0003] Not Applicable

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BACKGROUND

[0005] The present invention relates in general to the field of camera related accessories, and more particularly to an improved dolly and track system for movably supporting a cameraman and a tripod with a camera mounted thereon. The dolly and track system is adjustable and collapsible for portability.

[0006] Various camera-related accessories for filming both indoors and outdoors are known in the art. When filming, situations commonly arise wherein the camera and cameraman must travel over a distance while filming a scene. In these instances, maintaining the stability of the camera becomes difficult, especially when filming outdoors. A dolly and track assembly is frequently used in such situations to control the motion of the camera and ensure a smooth shot. The dolly supports the cameraman and the tripod on which the camera is mounted. Typically, the dolly includes a plurality of wheels or rollers for conveniently moving it on the track. The track principally consists of two rails with interconnecting members connecting them. In the present art, the dolly and track assemblies are heavy and unwieldy, requiring a large amount of time to install them at a given location. Moreover, transportation of the assembly is also difficult. Therefore, there is a need for a portable and collapsible dolly and track system.

[0007] Several dolly and track systems with portable and collapsible features have been developed in the art. For example, U.S. Pat. No. 4,471,969 to Zabala discloses a combination portable dolly and collapsible stool for transporting photography equipment; and for providing an elevated platform for taking photographs. The stool comprises a plurality of legs, which are collapsible and secured by an interlocking means. The stool also includes rollers mounted on the exterior of the legs, which support the base platform as a dolly after collapsing the legs. However, this device cannot be used to film while in motion.

[0008] U.S. Pat. No. 6,557,775 to Brinson discloses a portable and folding camera dolly track. The track can be assembled from a number of folding track sections, wherein each track section has a parallel pair of rails. Each rail includes a base and a cylindrical wheel-supporting rail element, and a transverse spacer. The device also includes a

continuous, removable, resilient cap on each wheel-supporting rail element to provide a smooth ride over joints formed by adjoining rail elements. This device does not include a collapsible dolly to accompany the track assembly.

[0009] U.S. Pat. No. 5,711,227 to Johnson discloses a portable and collapsible dolly and track system that movably supports a tripod, which in turn retains a camera. The track comprises a pair of opposite longitudinal parallel rails arranged in a space-apart relationship by three pivotable transverse bars. The pair of rails comprises a plurality of cylindrical tubes, which are held together with an elastic cord type joining member in order to enable them to be very quickly and efficiently assembled and set into place and then disassembled for storage. The dolly mainly comprises two bars and when assembled it forms a "T" shaped structure. The "T" shaped dolly has a plurality of holes thereon for securing bottom ends of the legs of the tripod. Although the structural and the functional aspects appear to be similar, this dolly and track system is different from the present invention in many ways; for example, this system lacks any means to adjust the width of the track and the dolly does not include any provision to support a cameraman along with the tripod.

[0010] Therefore, it is an object of the present invention to provide an improved dolly and track with a means to adjust their width.

[0011] A further object is to provide an improved track system with a means to adjust its width without the need of any screws, bolts, or any other detachable fastening means.

[0012] A further object is to provide an improved dolly and track, which are easily collapsible and portable.

[0013] A further object is to provide an improved dolly that has convenient means to support a cameraman and a tripod with a camera thereon.

[0014] Finally, it is an object of the present invention to provide an improved curved track and straight track, and an improved dolly capable of traveling along either the curved or straight track.

SUMMARY

[0015] The present invention relates in general to the field of camera or motion picture shooting related accessories, and more particularly to a width-adjustable dolly and track system for movably supporting a cameraman and a tripod with a camera mounted thereon. Both the dolly and track systems are easily collapsible, portable, and can be stored in a suitable bag to carry them to filming locations.

[0016] The track system comprises a plurality of track sections that can be interconnected to form a track. Each track section includes two parallel rails, straight or curved, and a plurality of connecting members, preferably two, pivotally connected to the two parallel rails. The parallel rails are substantially circular in cross section to accommodate the wheels of the dolly, and the connecting members are flat planar structures. When the track is assembled and ready for use, the connecting members are parallel to each other, maintaining a specific width between the parallel rails. In order to achieve a different width, the track section can be pivotally rotated such that the connecting members are in crossed relationship with other, which results in a narrower width between the parallel rails.

[0017] The present invention includes two embodiments of the dolly. The first embodiment of the dolly is generally a T-shaped structure and mainly includes a longitudinal bar, a transverse bar, and a platform detachably connected to the longitudinal and transverse bars. The transverse bar includes a plurality of mounting points along its length, such that the platform can be detachably connected to any of these mounting points, thereby maintaining different widths of the dolly. The platform in this embodiment provides a support for the tripod, camera, stool and cameraman.

[0018] The second embodiment of the dolly includes a center platform, a plurality of inner and outer arms, a plurality of wheel mounting means, and a plurality of wheels. The inner and outer arms include a plurality of mounting points. The outer arms can be telescopically movable inside the inner arms and connected to any of the mounting points, thereby maintaining different widths of the dolly. Additionally, a seat is also included to support the cameraman.

[0019] Both the first and second embodiments of the dolly include suitable means to secure different types of tripods. Once the dolly and the track have been assembled, the dolly is placed on top of the track. Following which, the dolly supporting a cameraman and a tripod with a camera mounted thereon is movable on the track. These and other features, aspects, and advantages of the present invention will become better understood with reference to the following description and appended claims.

BRIEF DESCRIPTION OF THE FIGURES

[0020] FIG. 1 is a perspective view of an individual straight track section in accordance with the present invention.

[0021] FIG. 2A is a perspective view of an individual straight track section with the cross members in a parallel orientation.

[0022] FIG. 2B is a perspective view of an individual straight track section as it is being folded into a crossed cross member orientation.

[0023] FIG. 2C is a perspective view of an individual straight track section as it is folded further toward a crossed cross member orientation.

[0024] FIG. 2D is a perspective view of an individual straight track section as it is folded toward a crossed cross member orientation, with the cross members starting to overlap.

[0025] FIG. 2E is a perspective view of an individual straight track section as it nears a crossed cross member orientation.

[0026] FIG. 2F is a perspective view of an individual straight track section in a crossed cross member orientation.

[0027] FIG. 3 is a perspective view of an individual curved track section in a parallel cross member orientation.

[0028] FIG. 4 is a perspective view of an individual curved track section in a crossed cross member orientation.

[0029] FIG. 5 is a perspective view of the longitudinal bar of the first embodiment of the dolly.

[0030] FIG. 6 is a perspective view of the transverse bar of the first embodiment of the dolly.

[0031] FIG. 7 is a perspective view of the first embodiment of the dolly assembled to fit the unfolded track.

[0032] FIG. 8 is a perspective view of the first embodiment of the dolly assembled to fit the folded track.

[0033] FIG. 9 is a perspective view of the first embodiment of the dolly placed on top of the unfolded straight track along with a secured tripod.

[0034] FIG. 10 is a perspective view of the first embodiment of the dolly placed on top of the unfolded curved track along with a secured tripod.

[0035] FIG. 11 is a perspective view of the first embodiment of the dolly placed on top of the folded straight track along with a secured tripod.

[0036] FIG. 12 is a view of the disassembled parts of the second embodiment of the dolly.

[0037] FIG. 13 is a perspective view of the second embodiment of the dolly in its assembled condition and placed on top of the curved track.

FIGURES—REFERENCE NUMERALS

- [0038] 10 . . . Straight Track Section
- [0039] 11 . . . Straight Rail
- [0040] 12 . . . Connecting Member
- [0041] 13 . . . Pivotal Connection
- [0042] 14 . . . Diagonal
- [0043] 15 . . . Curved Track Section
- [0044] 16 . . . Curved Rail
- [0045] 17 . . . Longitudinal Bar
- [0046] 18 . . . Transverse Bar
- [0047] 19 . . . Mounting Point
- [0048] 20 . . . Wheel
- [0049] 21 . . . Platform
- [0050] 22 . . . Rubber Strap
- [0051] 23 . . . Tripod
- [0052] 24 . . . Center Platform
- [0053] 25 . . . Inner Arm
- [0054] 26 . . . Outer Arm
- [0055] 27 . . . Seat
- [0056] 28 . . . Seat Support
- [0057] 29 . . . Wheel Mount
- [0058] 30 . . . Bolt and Nut Assembly

DESCRIPTION

[0059] Referring to FIG. 1, a straight track section 10 of the present invention comprises two parallel rails 11, two connecting members 12, and a plurality of pivotal connection means 13. The parallel rails 11 are circular in cross section, and are preferably hollow cylindrical tubes, and the

connecting members **12** are preferably flat planar structures. The parallel rails **11** include a proximal end and a distal end. The opposite ends of the first connecting member **12A** are pivotally connected to the proximal ends of the two parallel rails, while the opposite end of the second connecting member **12B** are pivotally connected to the distal ends of the two parallel rails, whereby the whole track section **10** forms a substantial quadrilateral enclosure. In this position, the two connecting members **12** are parallel to each other, thereby maintaining a specific width between the parallel rails **11**. The pivotal connection means **13** maintain a gap between the opposite ends of the connecting members **12** and the parallel rails **11**.

[0060] The pivotal connection means **13** enable the track section to be moved or rotated pivotally along a diagonal **14** of the quadrilateral enclosure. Referring to FIGS. 2A to 2F, different positions of the track section **10** when moved along the diagonal **14** are illustrated. Continuation of this diagonal movement will result in a position wherein the two connecting members **12** and the parallel rails **11** line up with each other. In such an instance, the proximal end of the first parallel rail **11A** can pass over the distal end of the second parallel rail **11B**. In addition, the portion of the first connecting member **12A** connected to the proximal end of the first parallel rail **11A** can pass under the gap maintained between the distal end of the second parallel rail **11B** and the second connecting member **12B**. This diagonal movement is continued until the two connecting members **12A** and **12B** are in crossed-relationship with each other and the two rails are once again parallel to each other as shown in FIG. 2F. The width between the parallel rails **11** when the two connecting members **12** are in crossed-relationship is less than the width maintained between the parallel rails **11** when the two connecting members **12** are in parallel-relationship. Interconnecting the plurality of straight track sections will form a straight track. Plastic dowel pins are precision machined to fit inside precision machined ends of curved and straight track to secure the different track sections.

[0061] Referring to FIG. 3, a curved track section **15** mainly includes two curved parallel rails **16**, two connecting members **12**, and a pivotal connection means **13**. The construction of the curved track section **15** is similar to that of the straight track section **10** as described above. The curved track section **15** can also be operated in a similar way as that of the straight track to achieve two different widths between the parallel rails **16**. FIG. 4 illustrates the folded curved track, which maintains a different width between the rails compared to the unfolded track in FIG. 3. Interconnecting the plurality of curved track sections **15** will form a curved track. The straight **10** and curved track sections **15** can also be interconnected. Plastic dowel pins are precision machined to fit inside precision machined ends of curved and straight track to secure the different track sections.

[0062] The first embodiment of the collapsible dolly mainly includes a longitudinal bar **17** and a transverse bar **18**. Referring to FIG. 5, the longitudinal bar **17** with two opposite ends further includes a plurality of mounting points **19** and a plurality of wheels **20** mounted along its length. The plurality of wheels **20** are further categorized according to the axis of rotation. The plurality of wheels **20A** with an axis of rotation parallel to the ground are designed to abut the top of the rails, while the plurality of wheels **20B** with axis of rotation perpendicular to the ground are designed to

abut the inner side surface of the rails. Referring to FIG. 6, the transverse bar **18** with a proximal end and a distal end also includes a plurality of mounting points **19** along its length. The distal end of the transverse bar **18** includes a plurality of wheels **20**. The dolly further includes a platform **21** to interconnect the longitudinal and transverse bars **17** and **18**. The platform **21** is substantially triangular and one of its sides is detachably connected to the longitudinal bar **17** along its entire length by a plurality of fastening means such as a bolt and nut assembly. The vertex portion opposite to the side connected to longitudinal bar can be connected to any of the mounting points **19** on the transverse bar **18**.

[0063] The distance between the wheels **20** mounted on the longitudinal bar **17** and the wheels **20** on the distal end of the transverse bar **18** is referred to as the width of the dolly herein. Referring to FIG. 7, the platform **21** detachably connected to the longitudinal bar **17** and near the proximal end of the transverse bar **18** maintains a specific width of the dolly. The width of the dolly achieved in this manner is equal to the width of the unfolded tracks illustrated in FIGS. 1 and 3. Referring to FIG. 8, the platform **21** detachably connecting the longitudinal bar **17** and near the distal end of the transverse bar **18** maintains a lesser width of the dolly. The width of the dolly achieved in this manner is equal to the width of the folded tracks illustrated in FIGS. 2F and 4.

[0064] The dolly further includes different means to secure different types of tripods. To secure tripods with round rubber legs, custom Velcro straps (not shown) can be used. Rubber straps **22** are included at the distal end of the transverse bar **18** and at the two opposite ends of the longitudinal bar **17** to secure tripods with spiked legs. Referring to FIGS. 9 and 10, the dolly along with a secured tripod **23** placed on top of the unfolded straight and curved tracks is illustrated. A tripod **23** secured on the dolly placed on top of the folded straight track is illustrated in FIG. 11.

[0065] Referring to FIG. 12, the second embodiment of the dolly in its disassembled state is illustrated, which comprises a center platform **24**, three inner **25** and outer arms **26** with proximal and distal ends, a seat **27**, seat support **28**, plurality of wheels **20**, and three wheel mounting means **29**. The inner and outer arms also include a plurality of mounting points **19**. The proximal ends of the three inner arms **25** are detachably connected to the center platform **24** with a fastening means, such as a bolt and nut assembly **30**. The distal ends of the inner arms **25** are detachably connected to the proximal ends of the outer arms **26** with the bolt and nut assembly **30**. The three wheel mounting means **29** are also detachably connected to the distal ends of the outer arms **26**. The pluralities of wheels **20** are connected to the wheel mounting means **26** and can be categorized according to their axes of rotation. The plurality of wheels **20A** with an axis of rotation parallel to the ground are designed to abut the top of the rails, while the plurality of wheels **20B** with an axis of rotation perpendicular to the ground are designed to abut the inner or outer side surface of the rails. The seat support **28** connects the seat **27** to any of the outer arms **26**. The dolly further includes different means to secure different types of tripods, such as Velcro straps (not shown) and rubber straps **22** at the distal ends of the outer arms. The assembled second embodiment of the dolly along with a secured tripod placed on top of the curved track is illustrated in FIG. 13.

[0066] Several additional embodiments of the present invention are possible within the scope of the invention. For example, different widths of the track sections are possible for meeting the market demands. Many suitable and light-weight materials can be used to manufacture different parts of the track and the dolly. A plurality of seats can be installed in the second embodiment of the dolly to support other crew along with a cameraman. Accordingly, strong and tough materials can be used to manufacture the dolly and the track for withstanding the additional weight.

[0067] All features disclosed in this specification, including any accompanying claims, abstract, and drawings, may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0068] While specific apparatus has been disclosed in the preceding description, it should be understood that these specifics have been given for the purpose of disclosing the principles of the present invention and that many variations thereof will become apparent to those who are versed in the art. Therefore, the scope of the present invention is to be determined by the appended claims.

[0069] Any element in a claim that does not explicitly state “means for” performing a specified function, or “step for” performing a specific function, is not to be interpreted as a “means” or “step” clause as specified in 35 U.S.C. § 112, paragraph 6. In particular, the use of “step of” in the claims herein is not intended to invoke the provisions of 35 U.S.C. § 112, paragraph 6.

what is claimed is:

1. An improved system for movably supporting a cameraman and a camera tripod, comprising:
 - a) a track assembly comprising a plurality of collapsible straight and curved track sections, each track section comprising:
 - i) a pair of straight parallel rails arranged in a spaced apart relationship;
 - ii) two connecting members extending between and pivotally secured at their opposite ends to the pair of straight parallel rails, wherein the two connecting members along with the pair of straight parallel rails form a substantial quadrilateral-shaped enclosure; and
 - iii) a means for releasably securing adjoining track sections;
 - b) a collapsible dolly assembly movably carried on said pair of parallel rails, straight or curved, comprising:
 - i) a longitudinal bar with two opposite ends, a transverse bar with a proximal end and a distal end, and a plurality of mounting points thereon;
 - ii) a plurality of wheels mounted at the distal end of the transverse bar and a plurality of wheels mounted along the length of the longitudinal bar;
 - iii) a platform detachably connecting the longitudinal bar and the transverse bar with a fastening means, whereby the dolly takes a T-shaped configuration

maintaining a specific width between the plurality of wheels at the distal end of the transverse bar and the plurality of wheels at the longitudinal bar;

- iv) a means to detachably secure a tripod on the dolly;
- c) wherein said track assemblies, straight and curved, and said dolly assembly can be assembled to movably support a cameraman and a tripod with a camera mounted thereon, or disassembled when not in use for easy storage.
 2. The improved system of claim 1, wherein the track sections, the transverse bar, and the longitudinal bar are made of steel, high grade aluminum, or hard resin.
 3. The improved system of claim 1, wherein a plurality of locations on the transverse bar can be chosen to detachably connect the platform.
 4. The improved system of claim 1 and 3, wherein different widths of the dolly are achieved when the platform is detachably connected to the longitudinal bar and different locations of the transverse bar.
 5. The improved system of claim 1, 3, and 4, wherein the platform can support a cameraman.
 6. An improved system for movably supporting a cameraman and a camera tripod, comprising:
 - a) a track assembly comprising a plurality of straight and curved collapsible track sections, each said track section comprising:
 - i) a pair of straight parallel rails arranged in a spaced apart relationship;
 - ii) two connecting members extending between and pivotally secured at their opposite ends to the pair of straight parallel rails, whereby the two connecting members along with the pair of straight parallel rails form a substantial quadrilateral-shaped enclosure;
 - iii) a means for releasably securing adjoining track sections made of steel, high grade aluminum or hard resin;
 - b) a collapsible dolly assembly movably carried on said pair of parallel rails, straight or curved, comprising:
 - i) a center platform;
 - ii) a plurality of inner arms detachably connected to the center platform with a fastening means;
 - iii) a plurality of outer arms detachably connected to the inner arms with a fastening means;
 - iv) a plurality of wheel mounting means detachably connected to the distal ends of the outer arms with a fastening means;
 - v) a plurality of wheels connected to each wheel mounting means with a fastening means;
 - vi) a seat for supporting a cameraman;
 - vii) a seat support interconnecting the seat and any one of the outer arms;
 - viii) means to detachably secure a tripod on the dolly;
 - c) wherein the track assembly and the dolly assembly can be assembled to movably support a cameraman and a tripod with a camera mounted thereon, or disassembled when not in use for easy storage.

7. The improved system of claims 1 and 6, wherein the pivotal connecting means maintain a gap between the connecting member and the rails, whereby the straight and the curved track sections can be pivotally rotated following a diagonal of the quadrilateral enclosure to maintain a parallel or crossed relationship between the two connecting members.

8. The improved system of claims 1, 6, and 7, wherein the width of the straight and curved track sections when the two connecting members are in parallel relationship is greater than the width when the two connecting members in crossed relationship.

9. The improved system of claims 1 and 6, wherein the adjoining straight and curved track sections can also be releasably secured together.

10. The improved system of claim 6, wherein the tracks sections, the platform, the inner and outer arms, the seat, the seat supports, and the wheel mounting means are made of steel or high grade aluminum.

11. The improved system of claim 6, wherein proximal ends of the inner arms are detachably connected to the center platform with a fastening means.

12. The improved system of claim 6, wherein proximal ends of the outer arms are detachably connected to distal ends of the inner arms with a fastening means.

13. The improved system of claim 6, wherein the outer arms include a plurality of mounting points and can be telescopically moved inside the inner arms.

14. The improved system of claims 6 and 13, wherein any of the plurality of the mounting points on the outer arms can

be chosen to secure the outer arms to the inner arms, thereby achieving different widths of the dolly.

15. The improved system of claims 1 and 6, wherein the wheels are made of plastic, rubber, or polyurethane.

16. The improved system of claims 1, 6, 11, and 12, wherein the fastening means are nuts and bolts.

17. The improved system of claim 6, wherein a plurality of seats can be installed on the dolly by using a plurality of seat supports.

18. The improved system of claim 1, wherein the means to detachably secure a tripod are provided at the distal end of the transverse bar and at the two opposite ends of the longitudinal bar.

19. The improved system of claim 6, wherein the means to detachably secure a tripod are provided at the distal ends of the outer arms.

20. The improved system of claims 1, 6, 18, and 19, wherein Velcro straps or rubber straps are used as the means to detachably secure the tripod on the dolly.

21. The improved system of claim 1 and 6, wherein the axis of rotation of a first group of the plurality of wheels is parallel to the ground, said first group of wheels designed to abut the top surface of the rails.

22. The improved system of claim 1 and 6, wherein the axis of rotation of a second group of the plurality of wheels is perpendicular to the ground, and the second group of wheels is designed to abut the side surface of the rails.

* * * * *