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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2021/0362021 A1****Reed et al.**(43) **Pub. Date: Nov. 25, 2021**(54) **ROTARY LIFT ADJUSTABLE BASKETBALL GOAL**(52) **U.S. Cl.**CPC *A63B 63/083* (2013.01); *A63B 2063/002* (2013.01); *A63B 71/023* (2013.01)(71) Applicants: **Shawn Reed**, McKees Rocks, PA (US);
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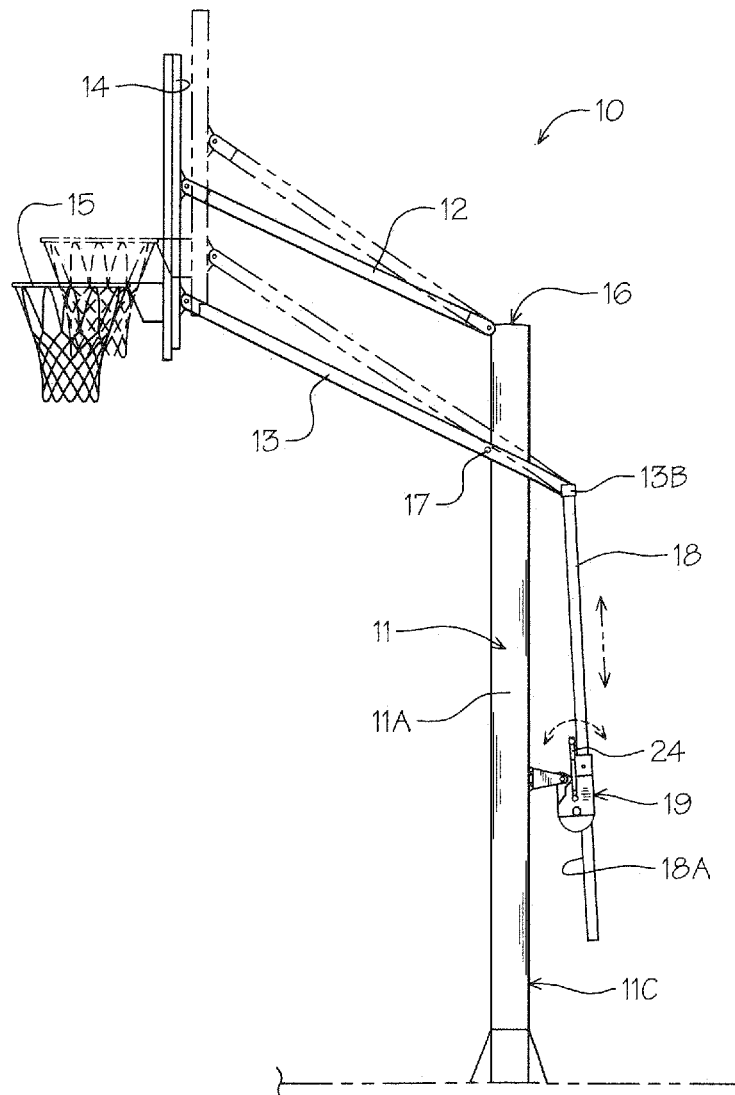
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ABSTRACT(72) Inventors: **Shawn Reed**, McKees Rocks, PA (US);
David Weckerly, Knox, PA (US)(21) Appl. No.: **17/319,449**(22) Filed: **May 13, 2021****Related U.S. Application Data**

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An adjustable basketball goal pivotally secured to a fixed support post with pairs of interengaged pivoted lever arms. A height adjustment mechanism is secured to the support post with a unidirectional activation connection bar extending therefrom pivotally interconnected to a pair of goal lever arm supports. A gear rack portion on the activation connection bar is positioned for registration within a double gear reduction drive engagement assembly having a user engagement crank arm extending therefrom providing selective directional rotation incrementally to elevate and lower the basketball goal in relation to the support post. A handle integrated automatic height adjustment braking system is provided assuring the goal assembly is retained in position during raising and lowering thereof.



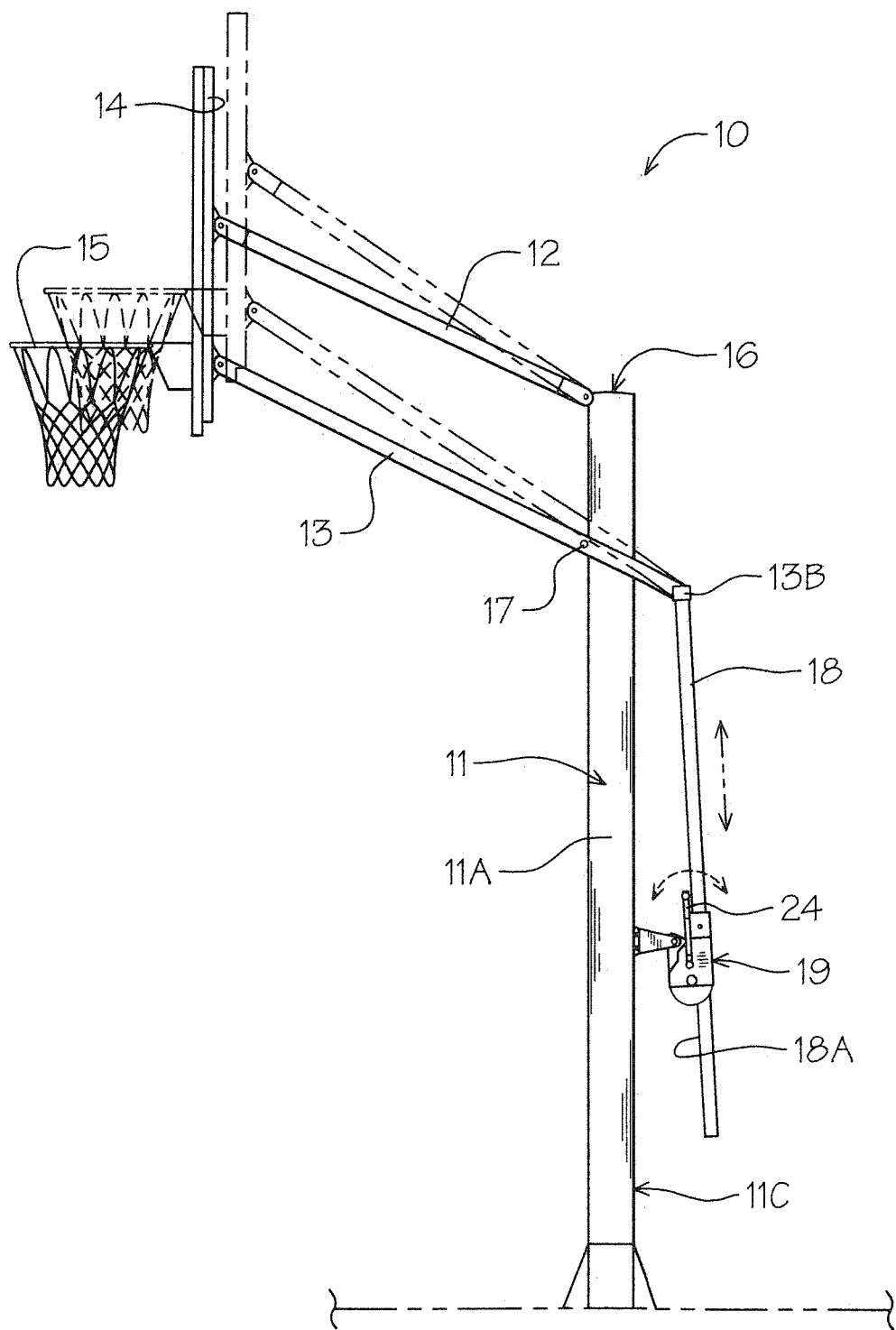


FIG. 1

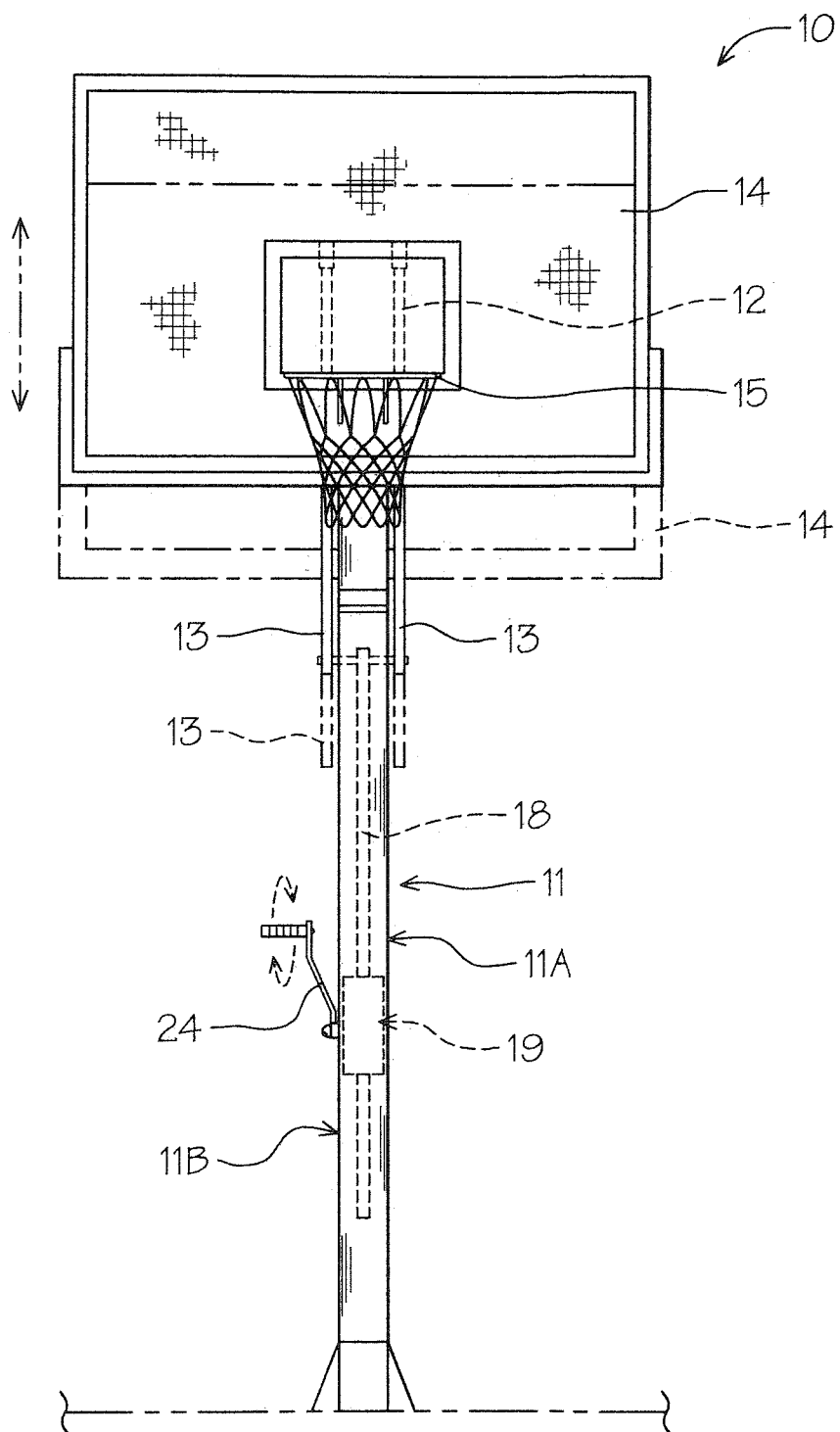


FIG. 2

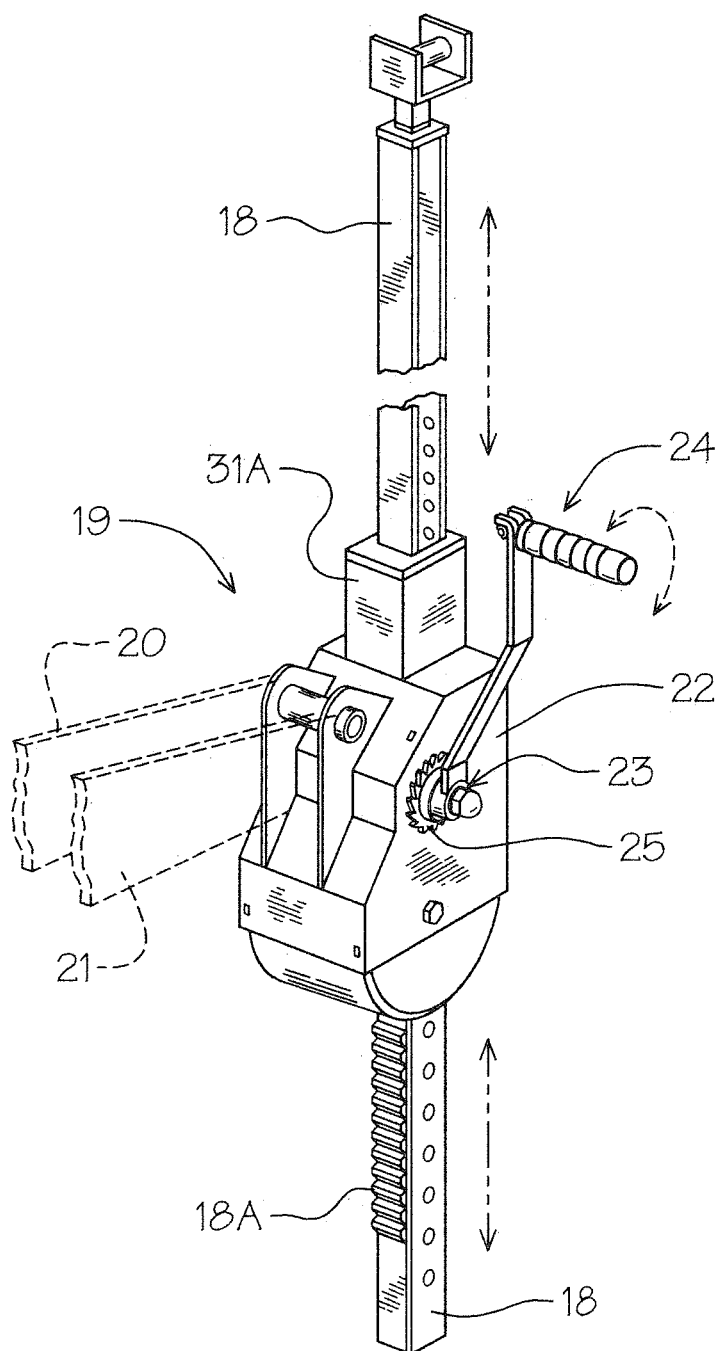


FIG. 3

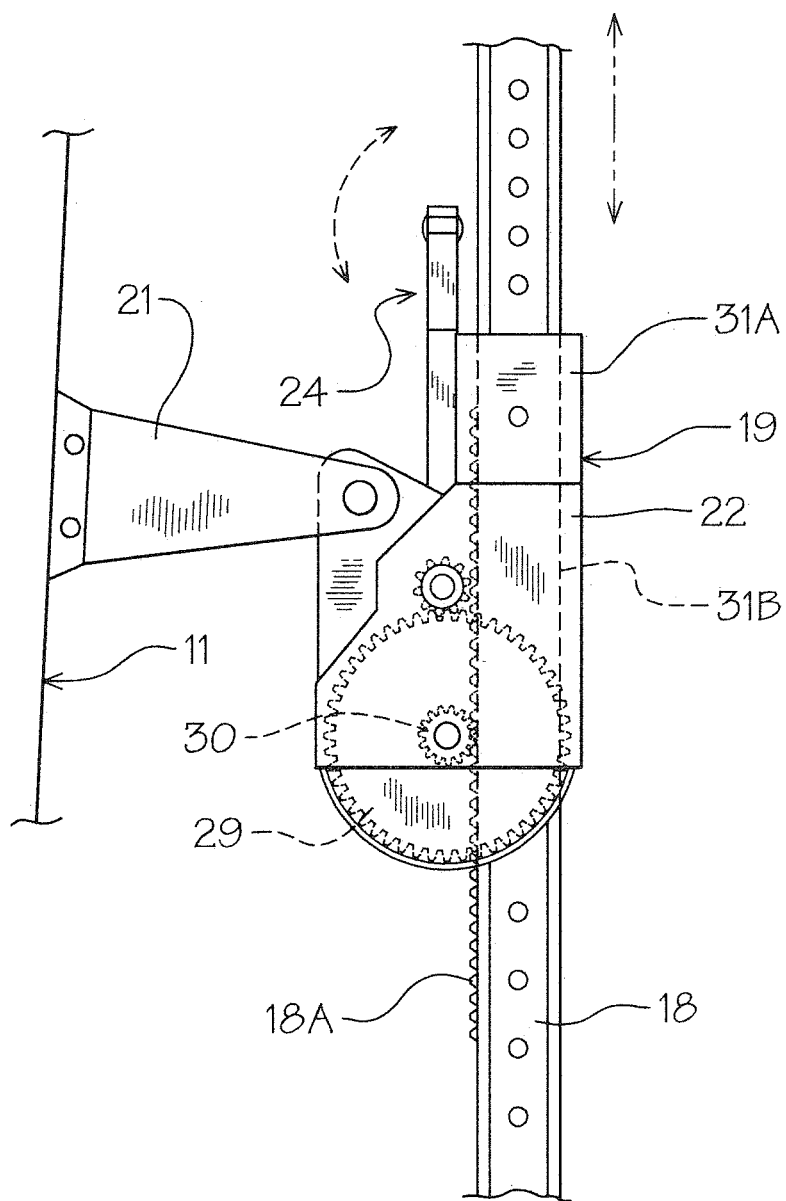


FIG. 4

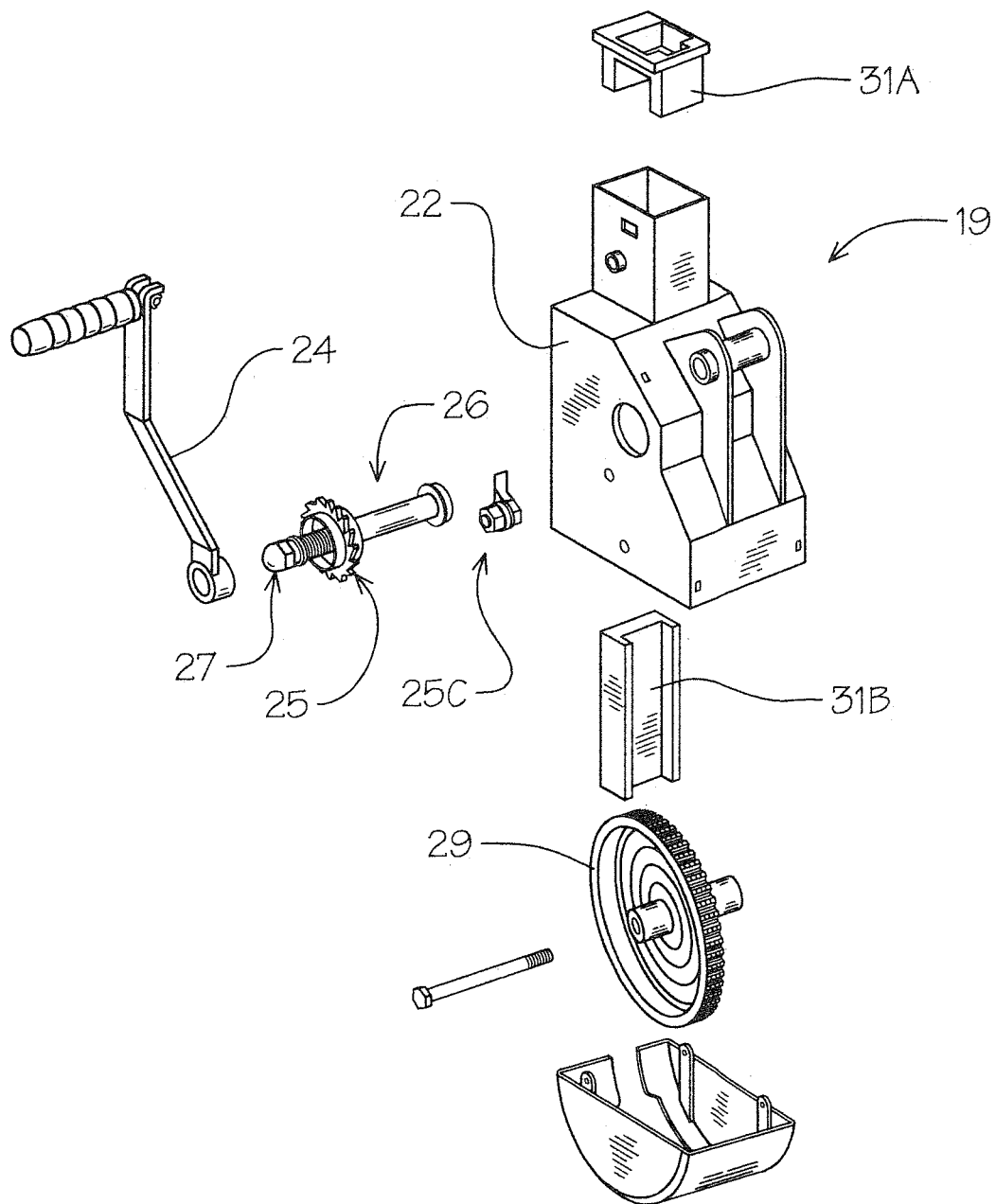


FIG. 5

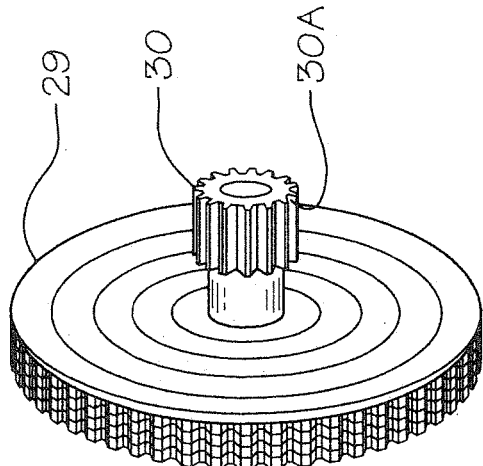
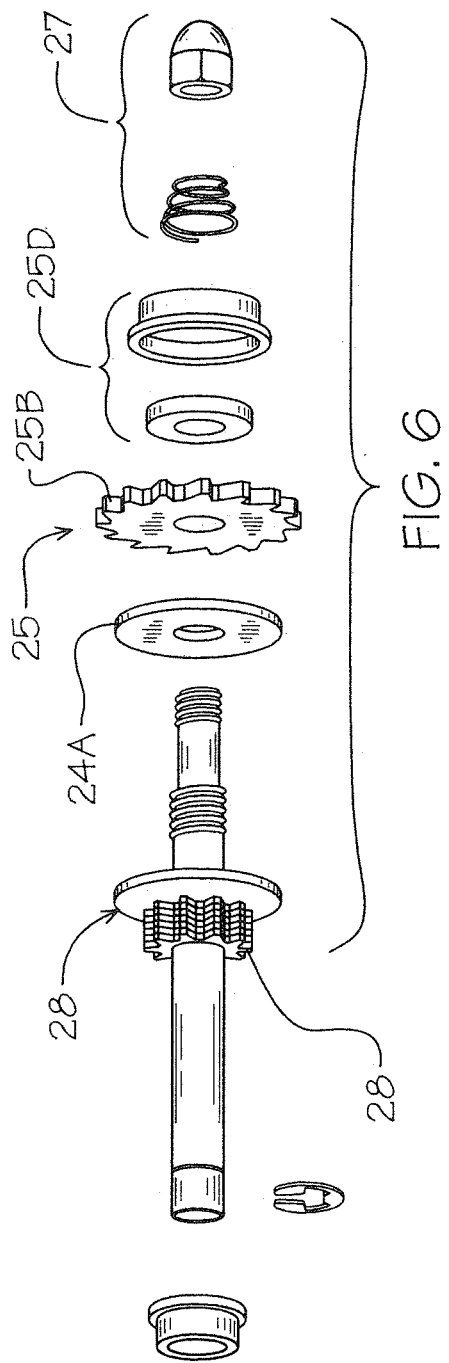


FIG. 7

ROTARY LIFT ADJUSTABLE BASKETBALL GOAL

[0001] This application claims the benefit of U.S. Provisional Application No. 63/026,221, filed May 18, 2020.

BACKGROUND OF THE INVENTION

1. Technical Field

[0002] This invention relates to sport goals, specifically basketball goals that are height adjustable to accommodate different player venues.

2. Description of Prior Art

[0003] Prior art adjustable basketball goals have been developed that use different goal post support adjustment systems, see for example U.S. Pat. Nos. 5,388,821, 6,273,834, 7,892,118, 8,708,844 and U.S. Patent Publication 2004/0018900A1.

[0004] U.S. Pat. No. 5,388,821 discloses a force lifting adjustment basketball goal having a counterweight with a basketball goal on a support post.

[0005] U.S. Pat. No. 6,273,834 claims a quick release self-adjusting latch for an adjustable basketball goal with a dual arm pivot support and adjustment mechanism having locking key selectively engaged within a plurality of opposing aligned spaced slots.

[0006] U.S. Pat. No. 7,892,118 describes a basketball goal having an adjustable hoop and backboard with an integrated adjustment rack having a remote release activation positioned on the support post.

[0007] U.S. Pat. No. 8,708,844 illustrates a basketball system with a pivoted multi-paired arm adjustable backboard and hoop configuration for vertical adjustment.

[0008] Finally, U.S. Publication 2007/0042843A1 discloses a basketball system having a basketball goal and support structure which is adjustable vertically by engagement of a pair of parallel spaced pivoted support arms to support post and a spring-loaded lever action adjustment for height system, all on a support structure which is movably positioned about the venue.

DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a side elevational view of the adjustable basketball goal in solid lines and in broken lines indicating height adjustability.

[0010] FIG. 2 is a front elevational view thereof.

[0011] FIG. 3 is an enlarged perspective view of the gear reduction ratchet height adjustment assembly with portions broken away.

[0012] FIG. 4 is a side elevational view thereof with portions broken away and in broken lines illustrating the adjustment engagement achieved.

[0013] FIG. 5 is an exploded perspective view of the rotary ratchet height assembly.

[0014] FIG. 6 is an enlarged exploded perspective view of a pinion shaft and auto braking assembly.

[0015] FIG. 7 is an enlarged perspective view of the first reduction gear and drive pinion gear.

SUMMARY OF THE INVENTION

[0016] A height adjustable basketball goal pivotally secured to a support post having an adjustable rotary lift

double gear reduction drive gear assembly secured to the ends of a pair of goal level support arms and pivotally secured and extending beyond the support post allowing for incremental vertical adjustment of the basketball goal on the support post.

DETAILED DESCRIPTION OF THE INVENTION

[0017] Referring now to FIGS. 1 and 2 of the drawings, a rotary lift adjustable basketball goal 10 of the invention can be seen having a hollow support post member 11. Pairs of vertically spaced upper and lower basketball backboard support arms 12 and 13 respectively extend in a parallelogram relationship. The backboard support arm pairs 12 and 13 are pivotally connected to a backboard 14 which includes a basketball rim and net assembly 15 as will be well understood by those skilled in the art. The backboard support arm pair 12 is pivotally secured on their respective proximal ends to apertured mounting brackets extending from the respective side surfaces 11A and 11B of the support post 11 and its upper end designated as 16.

[0018] Correspondingly, the backboard support arm pairs 13 are pivotally secured to and extend beyond the support post 11 side surfaces 11A and 11B in vertical spaced relation to the hereinbefore described support arm pairs 12 pivot point at 17.

[0019] It will thus be seen that a dual pivot point orientation of the parallelogram spaced upper and lower basketball backboard support arm pairs 12 and 13 will provide vertical adjustment movement to the pivotally attached backboard 14 while maintaining the backboard 14 in parallel vertical relationship to the support post 11 and keeping the basketball rim and net assembly 15 on a horizontal plane regardless of its vertical position.

[0020] A pivoting backboard activation connection bar 18 is pivotally connected to and between the respective apertured ends 13B of the backboard support arm pairs 13. The backboard activation bar 18 extends therefrom in parallel aligned spaced relation along the support post 11 and has an engagement gear rack insert surface portion 18A thereon, best seen in FIGS. 1, 3 and 4 of the drawings for registration with a rotary dual gear reduction type actuating height adjustment assembly 19. The rotary actuator height adjustment assembly 19 is mounted between a pair of apertured support brackets 20 and 21 extending in fixed relation from the support post 11 back surface 11C. The rotary actuator height adjustment assembly 19 has an open-ended housing 22 with a handle fitting 23 for receiving a user engagement crank handle 24 extending therefrom with an automatic braking assembly 25 best seen in FIGS. 2, 3 and 6 of the drawings.

[0021] Referring now to FIGS. 5 and 6 of the drawings, the crank handle 24 is threadably secured onto a pinion shaft assembly 26 with an automatic braking assembly 25 components including a brake disk 24A, ratchet socket 25B, and a bushing 25D. A compression spring and cap lock assembly 27 is positioned on the end of the pinion shaft assembly 26 which imparts rotational input from the crank handle to a first reduction main gear 29 having a second reduction pinion gear 30 extending therefrom, as best seen in FIG. 7 of the drawings.

[0022] The activation connection bar 18 pivotally attached to the end of the backboard support arms 12 and 13 with the gear rack insert surface portion 18A which is guidably

positioned through the adjustable drive assembly **19** by a synthetic frictional guide top cap **31A** and an internal friction guide pad channel **31B**.

[0023] It will be evident from the above description that selective uni-directional rotation of the crank arm **24** on the pinion shaft assembly **26** will rotate the pinion gear **30** in communication with the first reduction main gear **29** and therefore its correspondingly second gear reduction pinion gear **30** whose gear teeth **30A** will therefore engage and selectively raise or lower the backboard activation bar **18** and thereby the pivotally attached basketball backboard **14** as hereinbefore described.

[0024] Retained advancement of the backboard activation bar **18** and basketball backboard **14** is maintained by the unidirectional height adjustment automatic brake assembly **25** which controls the rate of descent as will be understood by those skilled in the art.

[0025] As it will be seen, the rotary lift mechanism of the present invention for adjustable height basketball system utilizes the double gear reduction system in tandem with an automatic brake assembly **25** that enables the user to easily raise and lower the hoop assembly **25** by simply turning the crank **24** one way or the other. This system, as described, does not require the user, not shown, to manually select an up or down mode only one interface point with the crank handle **24** is needed. It will therefore be evident that the current system's advantages over prior art is the speed and effort required to raise the rim and net assembly **15** from low setting to a high setting which can be achieved in a reduced number of rotations of the crank **24** with less effort in a shorter period of time. It will also be evident that the user can make the rim and net assembly **15** go up and down at any time by choosing to turn the crank **24** during clockwise rotation to raise the hoop, the rotary ratchet assembly **25C** clicks on the ratchet sprocket **25B** to lift the system incrementally, as described, and correspondingly if the user rotates the handle counter-clockwise direction to lower the rim and net assembly **15**, the automatic brake assembly **25** gradually slips allowing the rim and net assembly **15** to come down. It will be seen that the rim and net assembly **15** will only come down gradually as the braking assembly **25** will immediately engage if the crank handle **24** is released. It will therefore be seen that the combination of speed and safety overcomes many of the typical complaints of current prior art systems which tend to be cumbersome, time consuming and require more effort.

[0026] It will thus be seen that a new and novel rotary lift adjustable basketball goal has been illustrated and described and it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention.

Therefore I claim:

1. An adjustable basketball goal system for bi-directional height adjustment of a basketball goal above a playing surface comprising,

a rigid support member,

a first support structure including backboard support arm pairs pivotally connected to the basketball goal and the rigid support member,

a second support structure including a second backboard support arm pair pivotally connected to the backboard and the rigid support member forming a parallelogrammatical structure with said first support arm pair,

an extension activation bar pivotally connected at one end to the parallelogrammatical structure and at the other end to a rotary actuator height adjustment assembly secured to said rigid support member, wherein rotary movement of the rotary actuator height adjustment assembly raises and lowers the extension activation bar selectively deforming said second support structure for movement of the parallelogrammatical structure and the basketball goal assembly pivotally secured thereto.

2. The adjustable basketball goal set forth in claim **1** wherein said rotary actuation height adjustment assembly comprises,

an open-ended housing, pinion shaft assembly rotatably positioned therein comprising a crank handle, automatic braking assembly, a pinion gear in communication with a first reduction main gear in said housing having a second gear reduction pivot gear for engagement with said gear ratchet insert.

3. The adjustable basketball goal as set forth in claim **2** wherein said automatic braking assembly comprises,

a braking disk, a ratchet assembly and socket, a bushing and adjustable compression spring cap locking assembly.

4. The adjustable basketball goal set forth in claim **1** wherein said extension activation bar pivotally connected to the second support structure is in spaced parallel relation to said rigid support structure.

5. The adjustable basketball goal set forth in claim **1** wherein said activation bar moves relative to said second support structure.

6. The adjustable basketball goal set forth in claim **3** wherein said ratchet assembly comprises,

a selective stop positioned to engage the ratchet socket.

7. The adjustable basketball goal set forth in claim **1** wherein said second support structure comprises arms having a proximal end and a distal end, said proximal end pivotally connected to said basketball goal assembly and said distal end configured to pivotally engage the actuation bar end, and being pivotally connected to said support post there between.

8. The adjustable basketball goal set forth in claim **2** wherein said activation bar extends through said open ended support housing by a frictional guide top cap and a guide pad channel.

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