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# (12) United States Design Patent (10) Patent No.:

### Conner et al.

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#### (54) STEERING KNUCKLE FOR A DRIVING APPARATUS

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- (58) Field of Classification Search USPC ...... D12/159 CPC ..... F16C 11/0671; F16C 11/00; F16C 11/06; F16C 2326/24; F16F 9/3242; F16F 9/0218; F16F 9/0227; F16F 9/3221; F16F 9/3235; Y10T 16/62; Y10T 16/281

See application file for complete search history.

#### (56) **References Cited**

#### U.S. PATENT DOCUMENTS

3,749,415	A *	7/1973	Sampatacos B06G 7/005
4 618 159	A *	10/1986	280/124.136 Kozyra B60T 1/065
			180/253
4,722,540	A *	2/1988	Kozyra B60T 1/065 180/253
5,022,673	A	6/1991	Sekino et al.
5,120,150	A	6/1992	Kozyra et al.
5,366,233	A	11/1994	Kozyra et al.
6,179,308 1	B1	1/2001	Mielauskas et al.
6,739,422 1	B2	5/2004	Krude et al.
D612,304 S	S	3/2010	Mahnig et al.

8,297,632	B2	10/2012	Webster et al.
D686,952	S	7/2013	Rau et al.
8,794,647	B2	8/2014	Moessinger
2006/0110213	A1*	5/2006	Wolf B60G 7/008
			403/134
2013/0181421	A1	7/2013	Rohde et al.
2015/0251695	A1*	9/2015	Burgess B62D 7/16
			403/343

FOREIGN PATENT DOCUMENTS

CN	302660191	S	11/2013	
IN	2012MU00844		3/2013	
JP	2001-114127	Α	4/2001	
JP	2001-187583	Α	7/2001	
JP	1358555	S	5/2009	
JP	1447400	S	7/2012	
ЛЬ	2014-91469	Α	5/2014	
WO	WO 97/13674		4/1997	
WO	WO 9713674	A1 '	* 4/1997	 B62D 7/18

#### OTHER PUBLICATIONS

United States Office Action dated Feb. 12, 2016 in co-pending U.S. Appl. No. 14/532,564.

United States Office Action dated Feb. 12, 2016 in co-pending U.S. Appl. No. 14/876,367.

United States Office Action dated Dec. 21, 2015 in co-pending U.S. Appl. No. 29/503,930.

International Search Report in PCT/US2015/059017 dated Jan. 13, 2016.

Written Opinion of the International Searching Authority in PCT/US2015/059017.

United States Notice of Allowance dated Dec. 28, 2015 in copending U.S. Appl. No. 29/503,927.

\* cited by examiner

Primary Examiner — Michael A Pratt

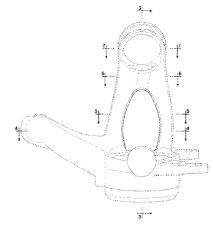
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#### (57) **CLAIM**

The ornamental design for a steering knuckle for a driving apparatus, as shown and described.

#### DESCRIPTION

FIG. 1 is a front view of a steering knuckle comprising an opening hole (environment), a recess having an omega-like



cross-section, and a beam connecting between the two (environment) as showing our new design;

FIG. 2 is a perspective view thereof;

FIG. **3** is an X-plane cross section view of a steering knuckle as showing our new design;

FIG. **4** is a first Y-plane cross section view of a steering knuckle as showing our new design;

FIG. **5** is a second Y-plane cross section view of a steering knuckle as showing our new design;

FIG. 6 is a third Y-plane cross section view of a steering knuckle as showing our new design;

FIG. 7 is an fourth Y-plane cross section view of a steering knuckle as showing our new design;

FIG. 8 is a first Z-plane cross section view of a steering knuckle as showing our new design;

FIG. **9** is a second Z-plane cross section view of a steering knuckle as showing our new design;

FIG. **10** is a third Z-plane cross section view of a steering knuckle as showing our new design;

FIG. **11** is a front view of a second embodiment of the steering knuckle;

FIG. **12** is a perspective view of the second embodiment of the steering knuckle;

FIG. **13** is a front view of a third embodiment of the steering knuckle;

FIG. **14** is a perspective view of the third embodiment of the steering knuckle;

FIG. **15** is a front view of a fourth embodiment of the steering knuckle;

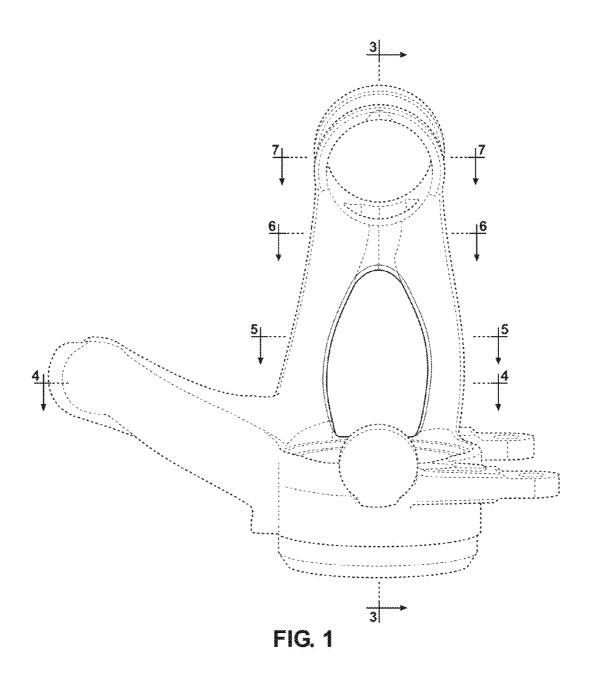
FIG. **16** is a perspective view of the fourth embodiment of the steering knuckle;

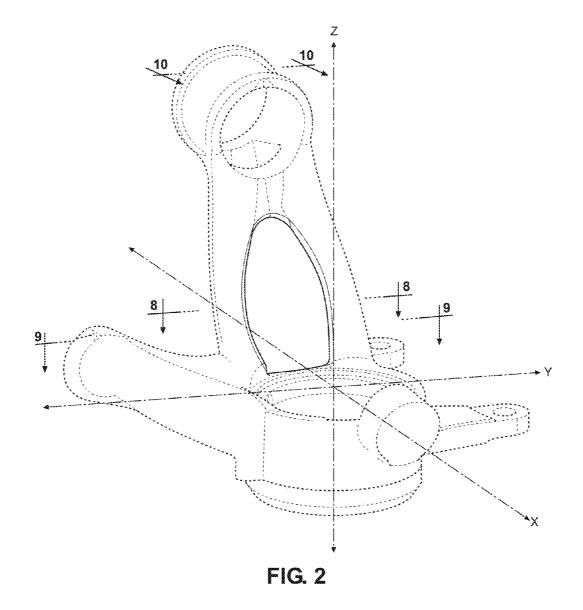
FIG. **17** is a front view of a fifth embodiment of the steering knuckle; and,

FIG. **18** is a perspective view of the fifth embodiment of the steering knuckle.

The broken line showing of portions of the steering knuckle forms no part of the claimed design.

#### 1 Claim, 18 Drawing Sheets





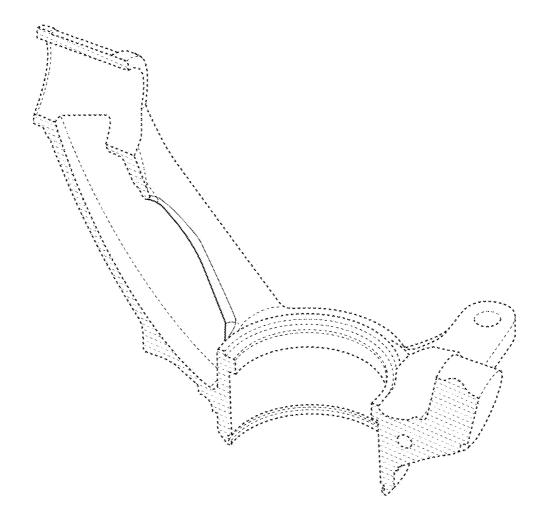


FIG. 3

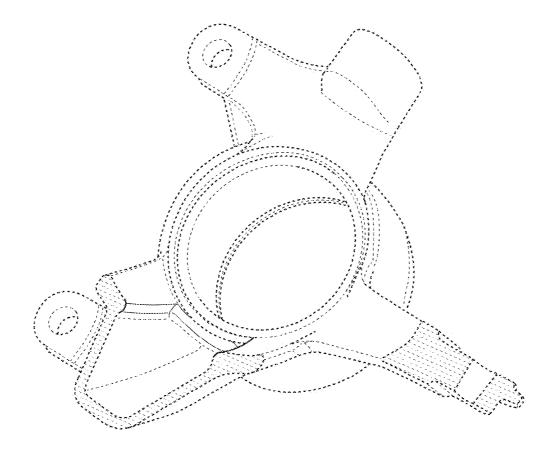
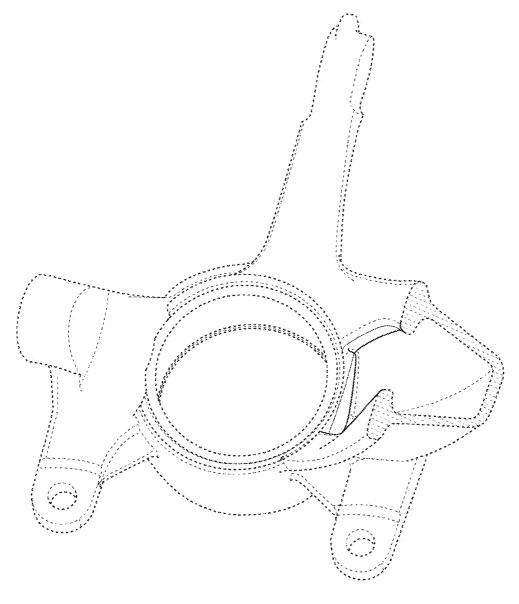


FIG. 4





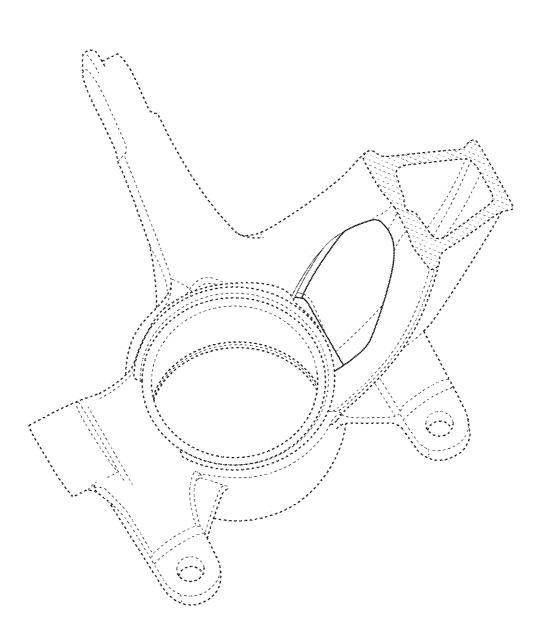


FIG. 6

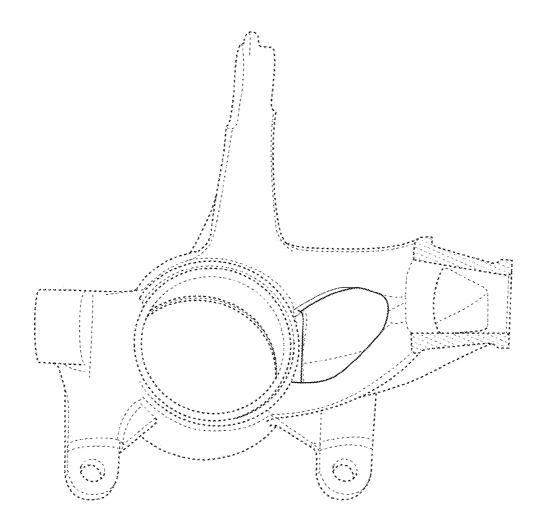


FIG. 7

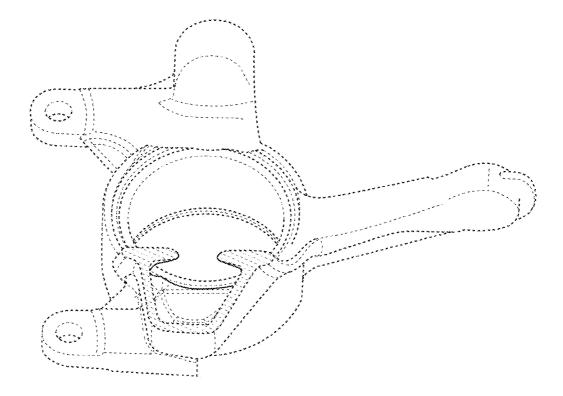


FIG. 8

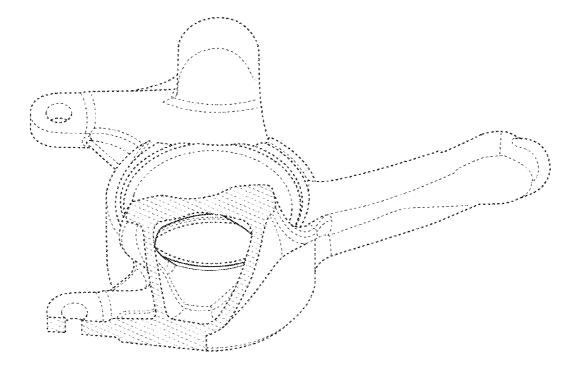
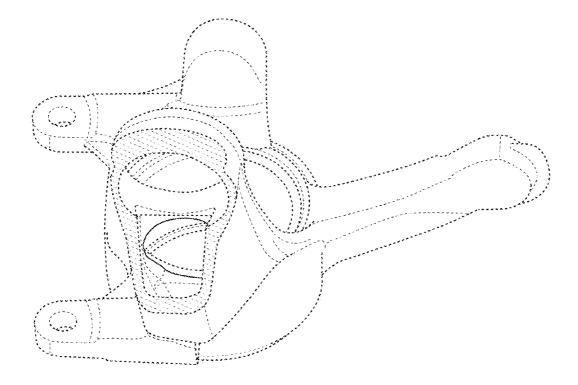


FIG. 9





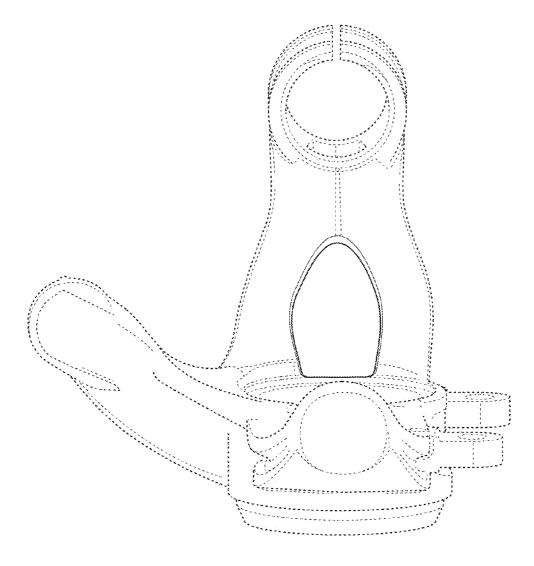


FIG. 11

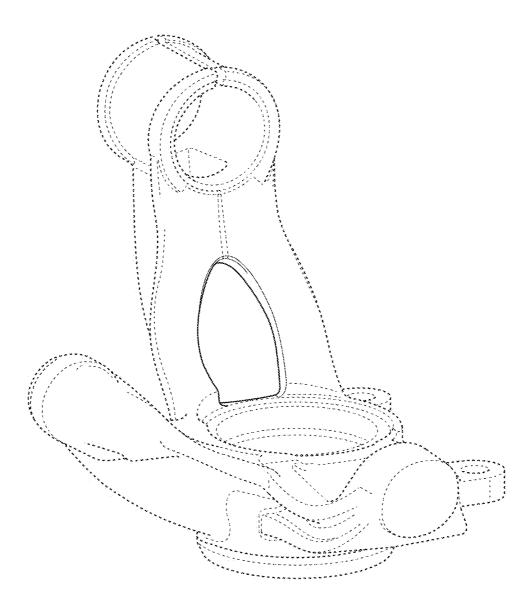


FIG. 12

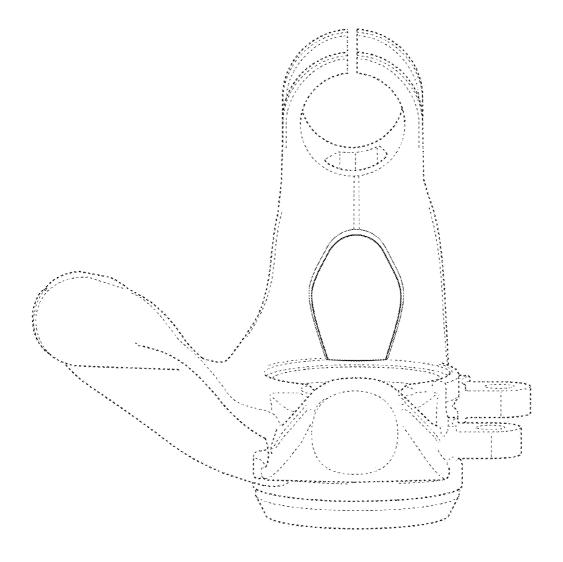


FIG. 13

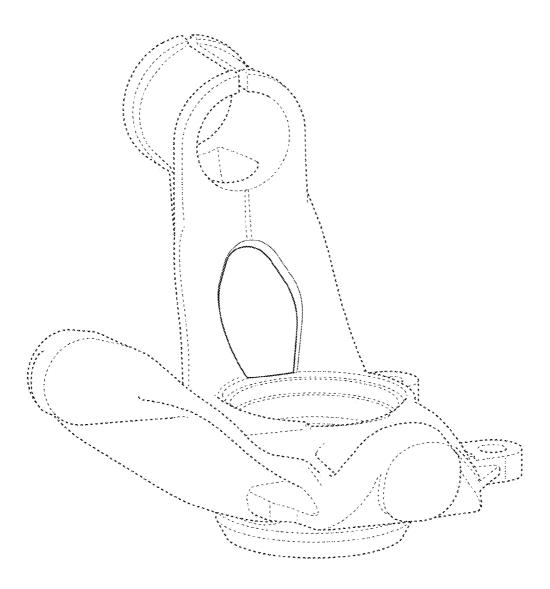
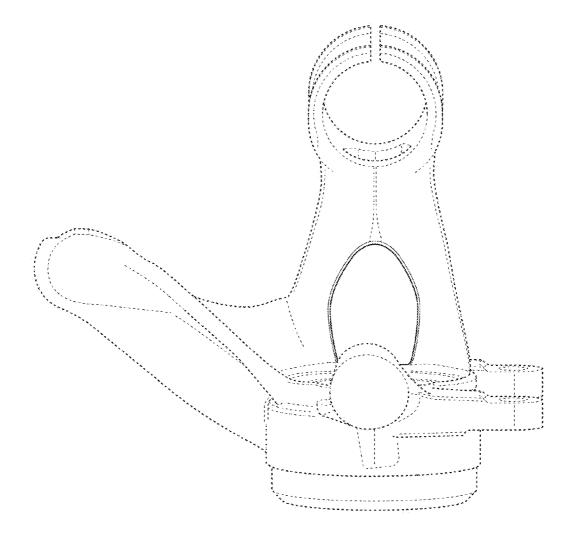


FIG. 14





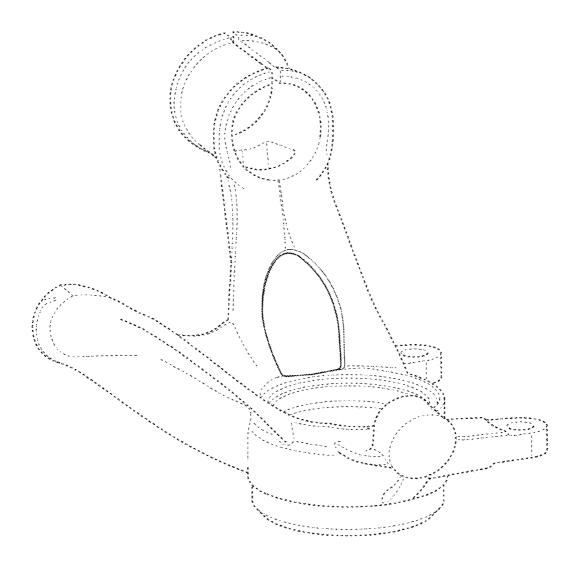
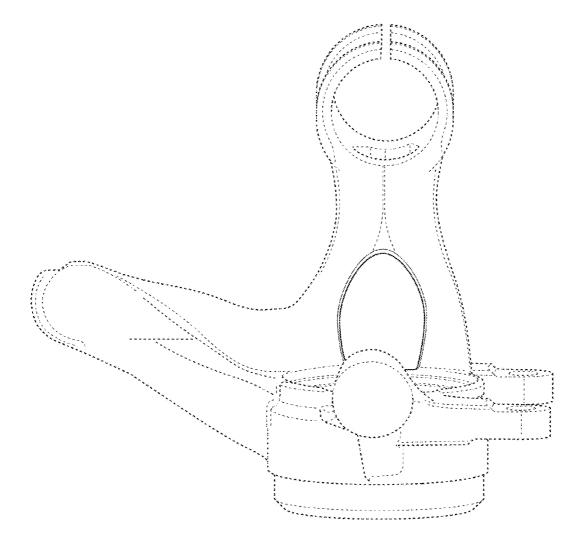


FIG. 16





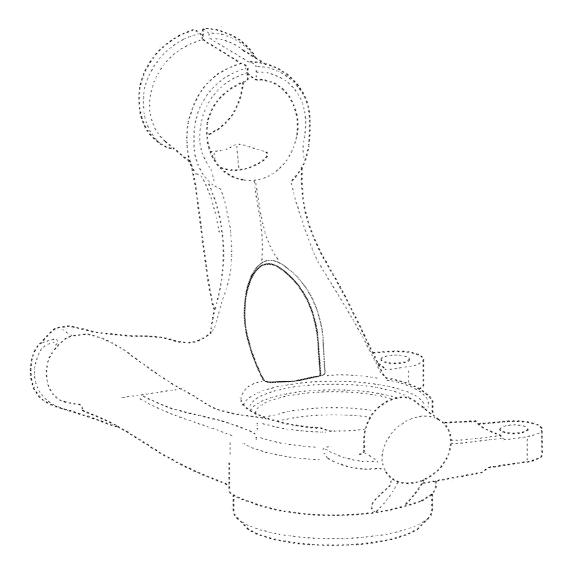


FIG. 18