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# (12) United States Patent Gao et al.

# (54) INSTRUMENT FOR APPLYING A TIE TO TWO ITEMS AND METHOD OF MAKING SAME

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See application file for complete search history.

# (56) References Cited

## U.S. PATENT DOCUMENTS

1,120,575 A	12/1914	Wertz
1,304,620 A	5/1919	Steingenic
1,365,649 A	1/1921	Bates
1,463,869 A	8/1923	Campbell
2.049.361 A	7/1936	Ericsson

# (10) Patent No.: US 7,131,467 B2

# (45) Date of Patent:

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2,279,068 A	7/1942	Siebrandt
2,291,413 A	7/1942	Siebrandt
2,455,609 A	12/1948	Scheib
2,657,718 A	11/1953	Greathouse
2,892,284 A	6/1959	Shawhan
3,273,605 A	9/1966	Feraara
3,507,270 A	4/1970	Ferrier
3,759,302 A	9/1973	Attenborough
3,865,155 A	2/1975	Saath
4,527,554 A	7/1985	Klein
4,880,038 A	11/1989	Meinershagen
4,935,027 A	6/1990	Yoon
5.004.020 A	4/1991	Meinershagen

#### (Continued)

#### OTHER PUBLICATIONS

U.S. Appl. No. 10/158,470, Instrument and Method for Pulling and Twisting Tie Onto Two Separated Items-Four Drawing Sheets, Figs. 1-4 Showing The Instrument.

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# (57) ABSTRACT

An instrument for applying a tie (12) to two items (10, 110), and a method of making same. The instrument is arranged for pulling separated bones or other items together and securing them together by twisting a tie onto them. The instrument can be made of plastic and it need not include any threaded parts. It can have two handles (21, 22) with a tie gripper (24) and a tie guide (26) on respective ones of the handles which can be squeezed together for pulling on a tie to draw separated items together. The handles rotate together, and there can be a crank (27) for effecting the rotation and thereby twist the tie onto the items.

### 25 Claims, 6 Drawing Sheets

