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(54) **Bending machine for tube or rod.**

(57) A numerically-controlled bending machine for tube or rod workpieces comprises a bend head (10, 11) including a bend former (14), collet chuck means (1) for supporting a workpiece at a predetermined position and axial orientation against the bend former, and means (14, 15) for clamping the workpiece against the bend former, the bend head being operated to rotate the bend former by a rack (13) and pinion (12) arrangement, wherein the rack includes a pre-settable mechanical stop (30) to control the extent of movement of the rack and hence the extent of bend angle. The required bend parameters are programmed into the control system using "user-friendly" language which is automatically convertible into CNC language for automatic control of the bending operation or sequence of bending operations.

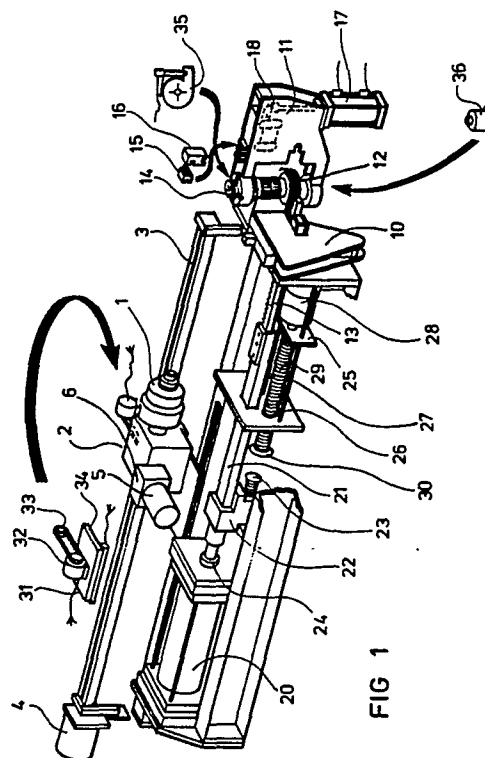


FIG 1

EP 0 227 429 A3



EP 86 30 9866

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	US-A-2 709 473 (GRACE et al.) * Figures 1-4; column 5, line 12 - column 6, line 5 * --	1	B 21 D 7/024 B 21 D 7/12
X	DE-A-3 019 111 (ERMETO BEZONS) * Figure; claims 1-6 * --	1,10	
A	US-A-3 821 525 (EATON et al.) * Figure 1; column 3, line 25 - column 4, line 20; column 10, lines 61-66 * --	1,3-7, 9-12	
A	US-A-3 352 136 (CLARKE) * Figures 1A,2A,2B,5; claims 1-9; column 4, line 1 - column 5, line 45 * -----	1,4-7, 9-12	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			B 21 D 7/00 B 21 D 9/00
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-02-1989	Examiner SUENDERMANN
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid.
- namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

X LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions.

namely:

1. Claims 1-7,10-12: Rack and pinion arrangement with pre-settable stop for rack for rotation of bend head, control arrangements and method
2. Claims 8,9: Collet chuck with jaws and annular actuation member

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid.
- namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

namely claims: 1-7,10-12