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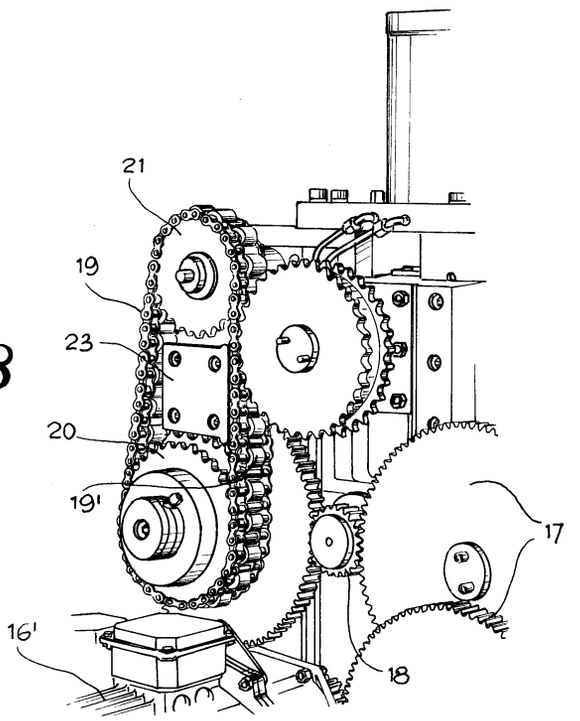
Remarks:
In accordance with the last part of Article 14 (2) EPC the applicant has filed a text with which it is intended to bring the translation into conformity with the original text of the application.

(54) Bending machine with actively operated central capstan

(57) This invention concerns a machine with three operating rolls, two of which are lower (12, 13) and placed side-by-side on axes with a fixed height, and an upper central one (14) on a movable axis that can be varied in height. The upper central roll (14) is commanded by a chain transmission (19), derived from the geared transmission that drives the lower rolls. The chain transmission is set more or less vertically and to one side of the axis of the upper central roll, which it engages tangentially.

Fig.3



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Description

[0001] This operating model refers to a bending machine of the type with three standard or special operating rolls, where the two lower ones are parallel and the upper role is variable in height above the lower two, according to requirements.

[0002] In the more traditional versions, these bending machines have an upper nip roll, or third roll, with a variable height, which either cannot be commanded directly or is commanded via systems that can create problems for its positioning above the lower rolls.

[0003] The aim of this invention is to build and supply a bending machine with three rolls, where the upper central roll, or third roll, is actively operated by means of a simple and efficient transmission that does not impede or restrict in any way the height positioning of said third roll - an action that may be carried out manually or by use of an actuator.

[0004] Another aim of the invention is to propose a bending machine in which the upper central roll is operated by a chain and using a clutch, the chain extending at a tangent to a toothed wheel on the axis of said roll.

[0005] The bending machine of this invention essentially conforms with claim 1 and will be described hereafter in greater detail and with reference to the enclosed exemplary drawings, where:

Fig. 1 shows a view of the machine from the side of the rolls;
Fig. 2 shows a view of the machine from the side of the operating means for the rolls;
Fig. 3 shows a perspective of the operating system in Fig. 2; and
Fig. 4 shows a side view of the system in Figs 2 and 3.

[0006] This machine consists of a support mount 11 which bears three operating rolls on the front: two lower rolls side-by-side 12, 13 and an upper roll 14, or third roll, positioned centrally above the lower ones. The lower rolls 12, 13 are on axes with a fixed height, whilst the upper central roll 14 is on a movable axis, variable in height, in parallel with the lower rolls, and, to this end, borne on a slide 15 running vertically up the support 11. These variations in the height of the upper central roll 14 can be controlled by a manual device or by means of a command actuator 16.

[0007] All the operating rolls 12-14 are set in motion by an electric motor 16' located behind the support mount 11. Said motor 16' uses a series of gears 17 to command a first lower roll 12 and, via an idler gear 18 in the middle, the other lower roll 13. The upper roll 14, or third roll, is commanded by a chain transmission 19 of the roller type, for example. More specifically, the chain 19 is passed over a first toothed wheel 20 on the axis of the lower roll 13 and over a second toothed wheel 21 placed on the support mount 11 at a higher level than the third roll 14.

[0008] This third roll 14 carries a third toothed wheel 22 on the same axis, which engages, on one side, a touching branch 19' of the chain 19 that stretches between the two toothed wheels 20 and 21.

[0009] As becomes clear from Figs 2 and 3, said branch 19' of the chain 19 is practically vertical, acting upon the third toothed wheel 22 tangentially and kept in permanent contact with the latter by a plate 23.

[0010] This layout ensures an active command of the upper roll or third roll 14 of the machine and, what is more, allows the height to be regulated without gearing or transmission problems.

Claims

1. Bending machine of the type with three standard or special rolls, with two lower rolls (12, 13) placed side-by-side and on an axis with fixed height, and an upper central roll or third roll (14) on a movable axis, variable in height, and where the lower rolls are operated by a geared transmission commanded by an electric motor, characterised by the fact that the upper central roll (14) is commanded by a chain transmission (19), deriving from the geared transmission that drives the lower rolls, said chain transmission being set more or less vertically to one side of the axis of the upper central roll.

2. Bending machine according to claim 1, in which the axis of the upper central roll (14) also holds a toothed wheel (22) and in which said chain transmission consists of a chain (19) passing over a first toothed wheel (20), fixed on the axis of one lower roll (13) and over a second toothed wheel (21), fastened to the support mount of the machine at a higher level than the upper central roll, and in which the toothed wheel (22) on the axis of the upper central wheel (14) engages a touching branch (19') of said chain.

3. Bending machine according to claim 2, in which said touching branch (19') of the chain (19) is set vertically

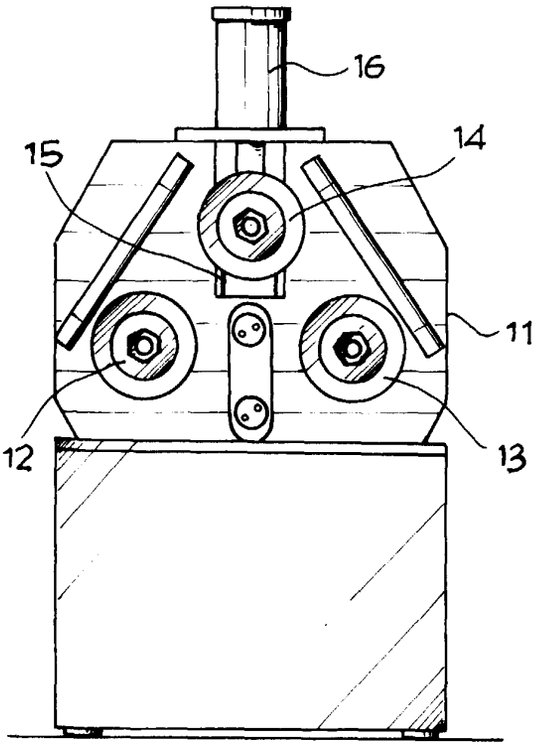

Fig.1

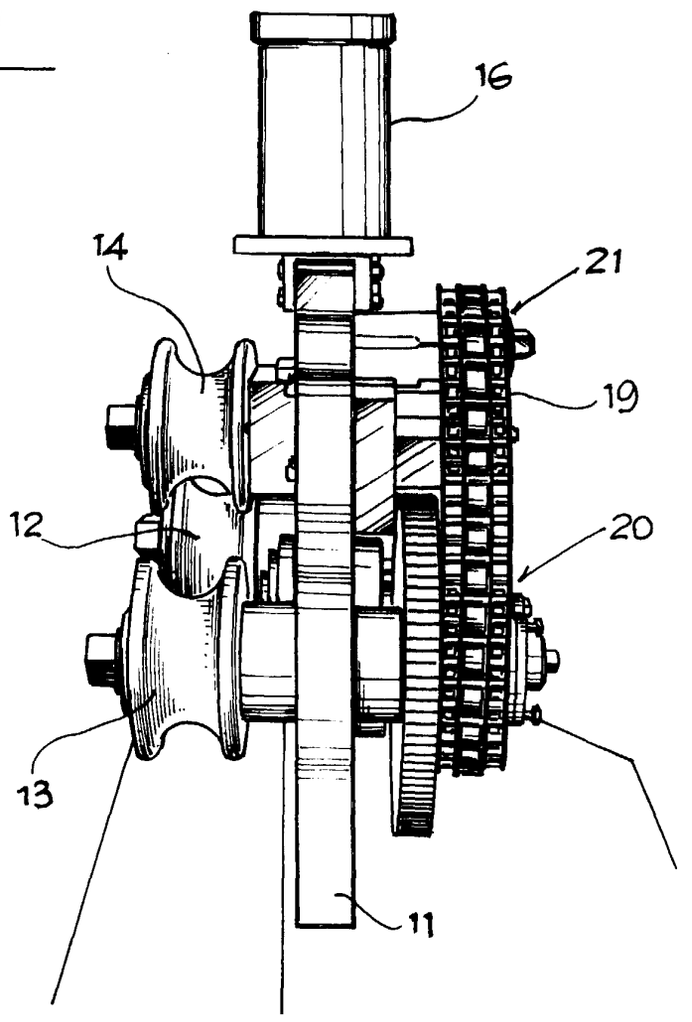

Fig.4

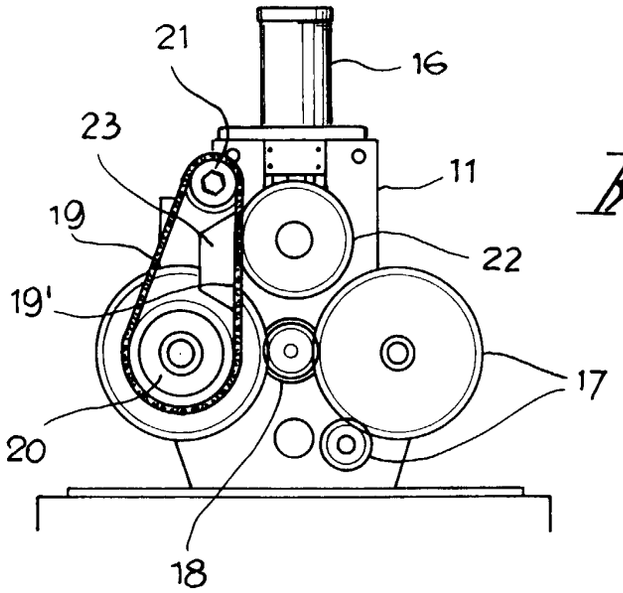

Fig. 2

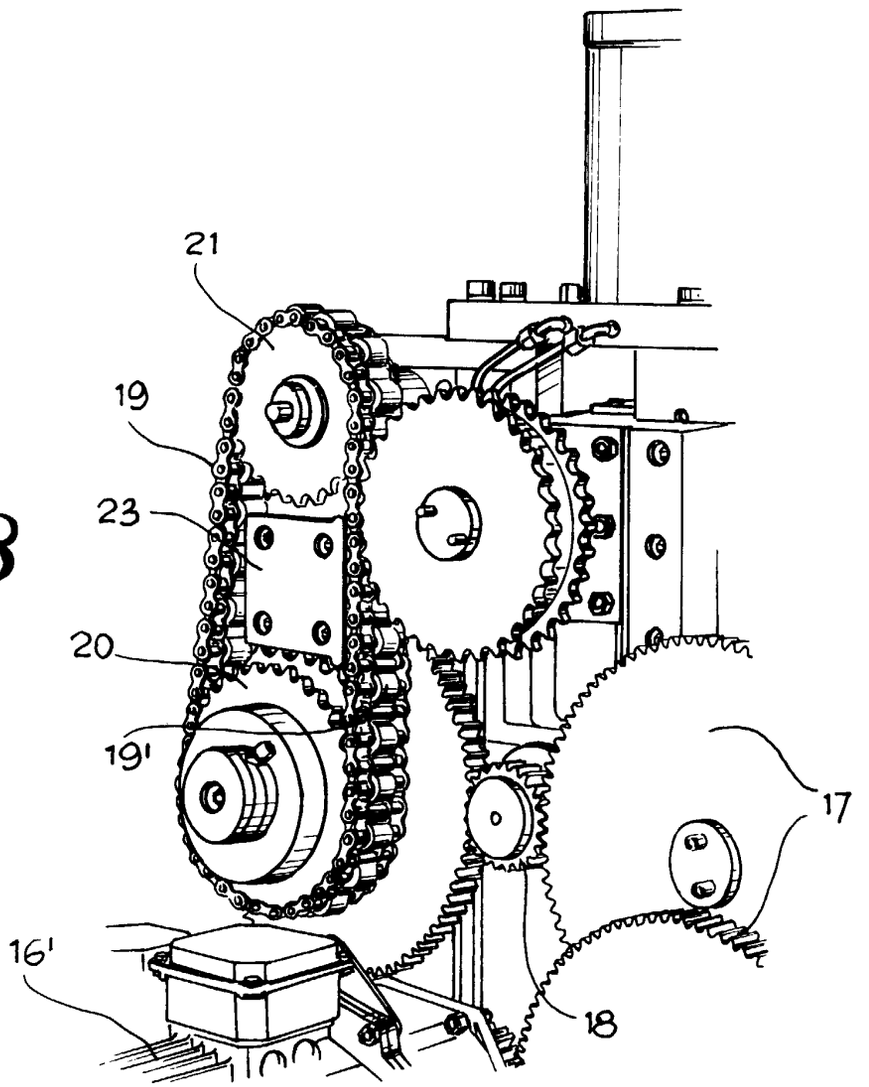

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 00 83 0273

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.7)
A	US 2 312 988 A (KANE & ROACH, INC., SYRACUSE) 2 March 1943 (1943-03-02) * figures 5,6 *	1	B21D5/14
A	DE 319 160 C (BLOHM & VOSS) 29 August 1918 (1918-08-29) * figure 2 *	1	
A	US 1 973 164 A (EDWARDS J. DREIS) 11 September 1934 (1934-09-11) * figures 1-6 *	1	
A	EP 0 584 486 A (MABI ISOLIERMASCHINEN) 2 March 1994 (1994-03-02) * figures 4-7 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)
B21D B21B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	6 September 2000	Vinci, V

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 83 0273

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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06-09-2000

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82