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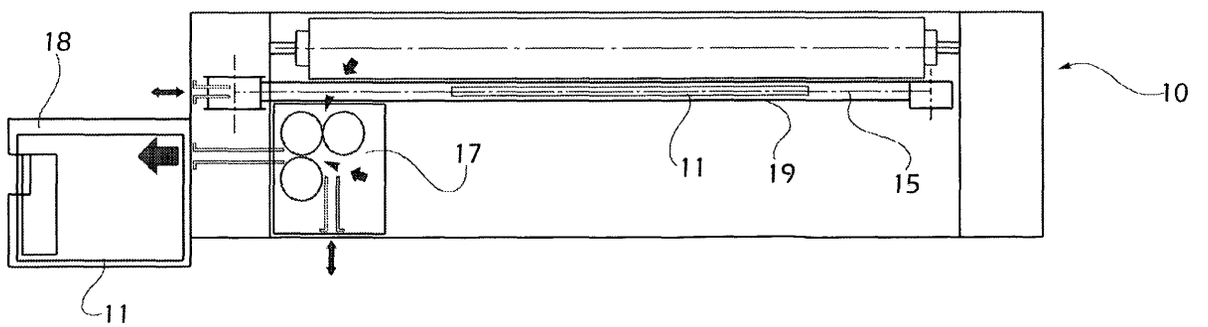
(54) A machine for the automatic folding of sheets of paper and the like

(57) The machine (10) comprises a first, longitudinal folding station (13) for folding, in a longitudinal direction, the sheets (11) that are supplied to the machine, a second, transverse folding station (17) for folding, in a transverse direction, the sheets coming form the first station (13), and a pocket (15) interposed between the first and the second folding stations (13, 17) and arranged to receive the longitudinally folded sheets from the first station (13) and for transporting those sheets, by associated belt conveyor means (16), towards the second station (17). The pocket (15) is also arranged to cooperate with the first station (13) during the longitudinal folding of the sheets and/or with the second station (17) during the transverse folding.

Fig. 4



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Description

[0001] The present invention relates to a machine for the automatic folding of sheets of paper and the like, particularly drawing sheets, of the type adapted to fold the sheets longitudinally and transversely.

[0002] Folding machines of the type specified above are commonly used in combination with printing machines or "plotters", for folding large-format drawing sheets (for example, A0, A1 or A2) coming out of the printing machines into sheets of smaller format (for example, A3 or A4). In general, these drawing sheets have an area or table in the lower right-hand corner giving descriptions relating to the illustrated drawing and any other necessary information. These sheets therefore have to be folded in a manner such as to ensure that this area remains in a visible position upon completion of the folding so that the drawing can be identified easily.

[0003] These machines comprise a first, longitudinal folding station adapted to fold, in a first, longitudinal direction, the sheets that are supplied to the machine, a second, transverse folding station adapted to fold, in a second, transverse direction, the sheets coming from the first station, and conveyor means for transporting the sheets from the first folding station to the second. Longitudinal/transverse folding machines according to the prior art are quite bulky since they are constituted by the two above-mentioned folding units and by conveyor means distinct from the folding units.

[0004] The object of the present invention is therefore to provide a folding machine of the type specified above which has more compact dimensions, a smaller number of components, and a simpler structure than the folding machines according to the above-described prior art.

[0005] This object is achieved in full according to the invention by means of a folding machine as defined in Claim 1.

[0006] In summary, the invention is based on the concept of producing a folding machine having a first folding station for the longitudinal folding of the sheets, a second folding station for the transverse folding of the sheets, and a collecting pocket which is common to the two folding stations, in which pocket the longitudinally folded sheets coming from the first station are deposited, and along which pocket those sheets are transported to the second station by conveyor means associated with the pocket.

[0007] The invention will be described in greater detail below purely by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a perspective view of a folding machine according to the present invention,
- Figure 2 is a partially transparent, schematic front elevational view of the folding machine of Figure 1,
- Figure 3 is a partially transparent, schematic side elevational view of the folding machine of Figure 1, and
- Figure 4 is a partially transparent, schematic plan view of the folding machine of Figure 1.

[0008] With reference to the drawings, a folding machine according to the invention, generally indicated 10, is adapted to automatically fold sheets of paper and the like, in particular drawing sheets 11, coming from a printing machine 12.

[0009] The machine 10 comprises a first, longitudinal folding station, generally indicated 13, of a type known *per se* (in the embodiment illustrated, a folding station of the so-called pocket type) which receives the sheets 11 supplied to the machine through an input opening 14. The sheets which come out of the first station 13 are deposited in a vertical pocket 15 which is formed substantially by a pair of parallel vertical walls 19 at the bottom of which a conveyor belt 16 is provided. The conveyor belt 16 transports the longitudinally folded sheets towards a second, transverse folding station, generally indicated 17, also of a type known *per* se (in the embodiment illustrated, a pocket folding station which also makes use of knives) which uses the pocket 15 for the first step of the transverse folding operation. The folded sheets which come out of the second station 17 are then supplied to a collecting device 18 mounted on a vertical side wall of the machine structure.

[0010] As will be appreciated, in order to transport the sheets from the first, longitudinal folding station to the second, transverse folding station, a sheet folding machine according to the present invention uses a pocket which is common to the two stations, as well as a belt conveyor device disposed at the bottom of the pocket. This arrangement thus enables the number of components and the dimensions of the machine to be reduced in comparison with conventional solutions in which conveyor devices distinct from the first and second stations are provided.

Claims

1. A folding machine (10) for automatically folding, in a longitudinal direction and in a transverse direction, sheets of paper and the like, in particular drawing sheets (11), the machine (10) comprising a first, longitudinal folding station (13) for folding, in a longitudinal direction, the sheets that are supplied to the machine, and a second, transverse folding station (17) for folding, in a transverse direction, the sheets coming from the first station (13), the machine being **characterized in that** it comprises, between the first and the second folding stations (13, 17), a pocket (15) arranged to receive the longitudinally folded sheets from the first station (13) and for transporting those sheets, by belt conveyor means (16), towards the second station (17), and **in that** the pocket (15) is arranged to cooperate with the first station (13) during the longitudinal folding

of the sheets and/or with the second station (17) during the transverse folding.

2. A folding machine according to Claim 1, **characterized in that** the pocket (15) comprises a pair of parallel vertical walls (19) defining, at the top, an opening for receiving the sheets coming from the first folding station (13), and **in that**, a conveyor belt (16) for transporting the sheets towards the second folding station (17) is disposed beneath the pocket (15).

3. A folding machine according to Claim 1 or Claim 2, **characterized in that** the first folding station (13) is of the pocket type and the second folding station (17) is of the pocket type with the assistance of knives.

Fig. 1

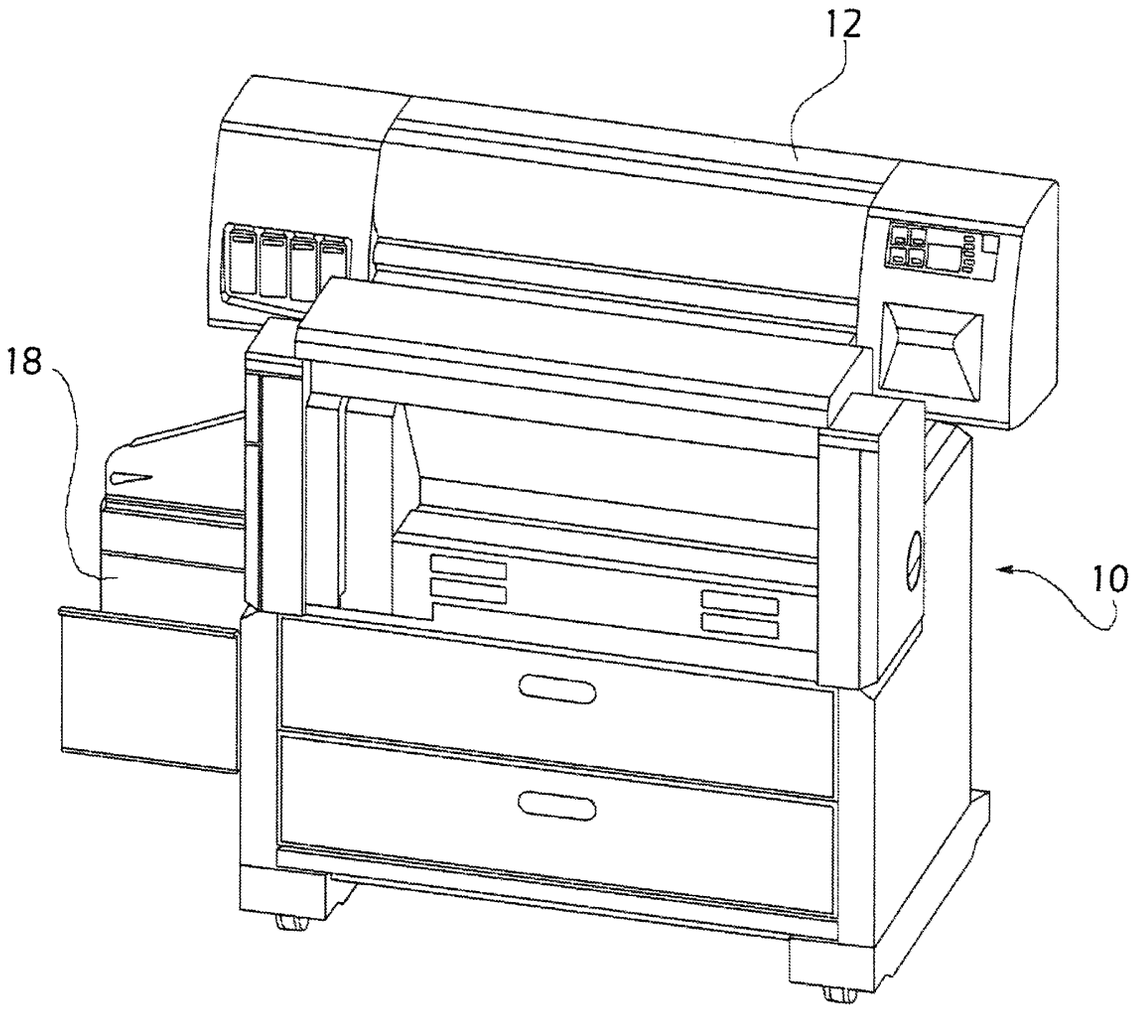


Fig. 3

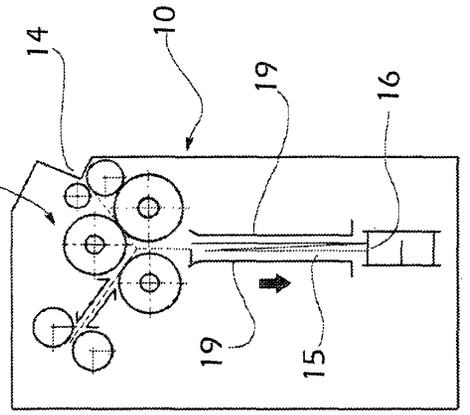


Fig. 2

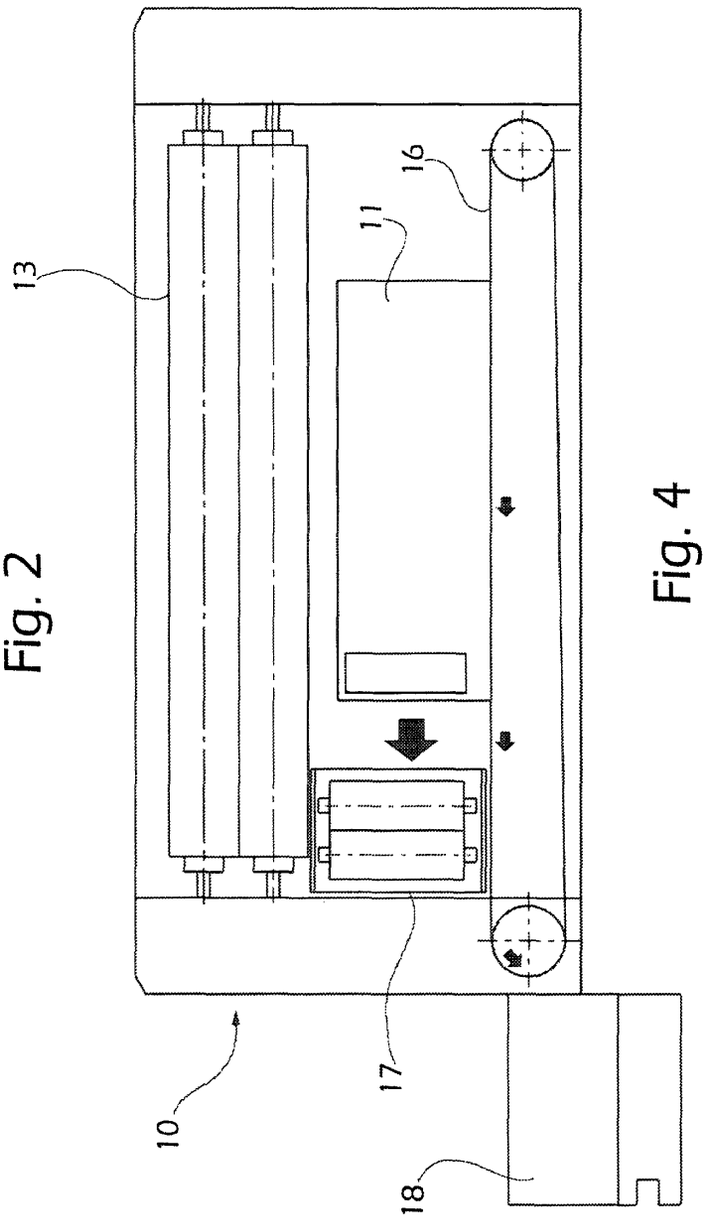
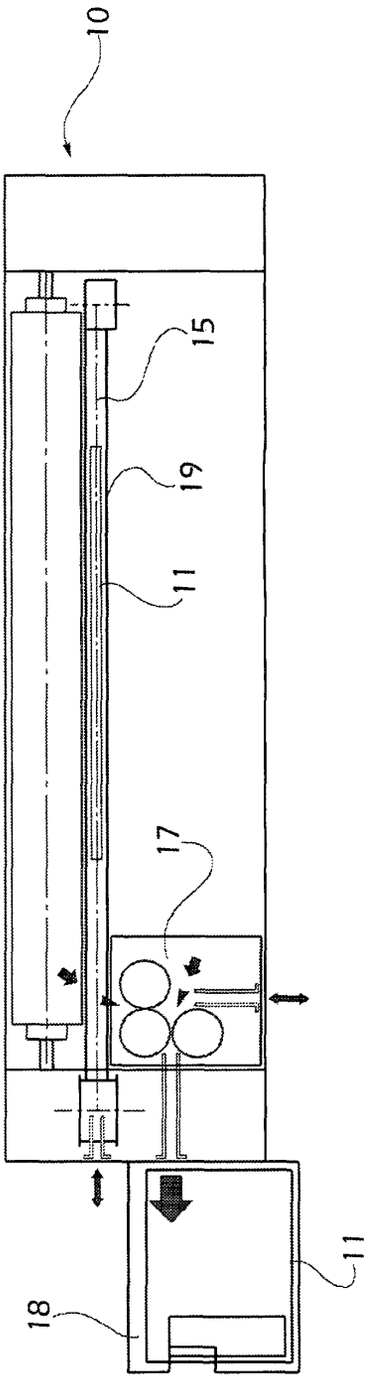


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 04 10 3177

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)
Y	GB 232 626 A (GEORG SPIESS) 8 July 1926 (1926-07-08) * page 1, line 46 - page 1, line 75; figures 1,2 *	1,2	B65H45/14
X		3	
Y	GB 530 970 A (DAVIDSON MFG CORP) 27 December 1940 (1940-12-27) * page 1, line 28 - line 47; figure 1 * * page 4, line 125 - page 5, line 57 *	1,2	
A	GB 363 310 A (CAMCO MACHINERY LTD) 11 December 1931 (1931-12-11) * the whole document *	1-3	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 September 2004	Hannam, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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14-09-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 232626 A	08-07-1926	CH 114921 A	17-05-1926
GB 530970 A	27-12-1940	NONE	
GB 363310 A	11-12-1931	NONE	

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