United States Patent [19]

Wirz

[11] **3,921,431**

[45] **Nov. 25, 1975**

[54] **DRAWROLL ARRANGEMENT**

[75] Inventor: **Armin Wirz**, Dietlikon, Switzerland

[73] Assignee: **Rieter Machine Works, Ltd.**, Winterthur, Switzerland

[22] Filed: **Nov. 8, 1973**

[21] Appl. No.: **413,987**

[30] **Foreign Application Priority Data**

Nov. 10, 1972 Switzerland 16378/72

[52] **U.S. Cl.** **72/289**

[51] **Int. Cl.²** **B21C 1/02**

[58] **Field of Search** 72/289, 287; 242/78

[56] **References Cited**

UNITED STATES PATENTS

1,950,901	3/1934	McIlvried	72/289
2,262,247	11/1941	Nye	72/289
3,296,418	1/1967	Johnson	219/471
3,463,893	8/1969	Chifu	219/10.61

FOREIGN PATENTS OR APPLICATIONS

548,667	3/1932	Germany	72/289
7,029,963	11/1970	Germany	
7,029,962	11/1970	Germany	
7,032,345	5/1971	Germany	
465,127	12/1968	Switzerland	
492,809	8/1970	Switzerland	
989,349	9/1962	United Kingdom	
1,495,882	10/1966	France	
1,760,627	9/1973	Germany	

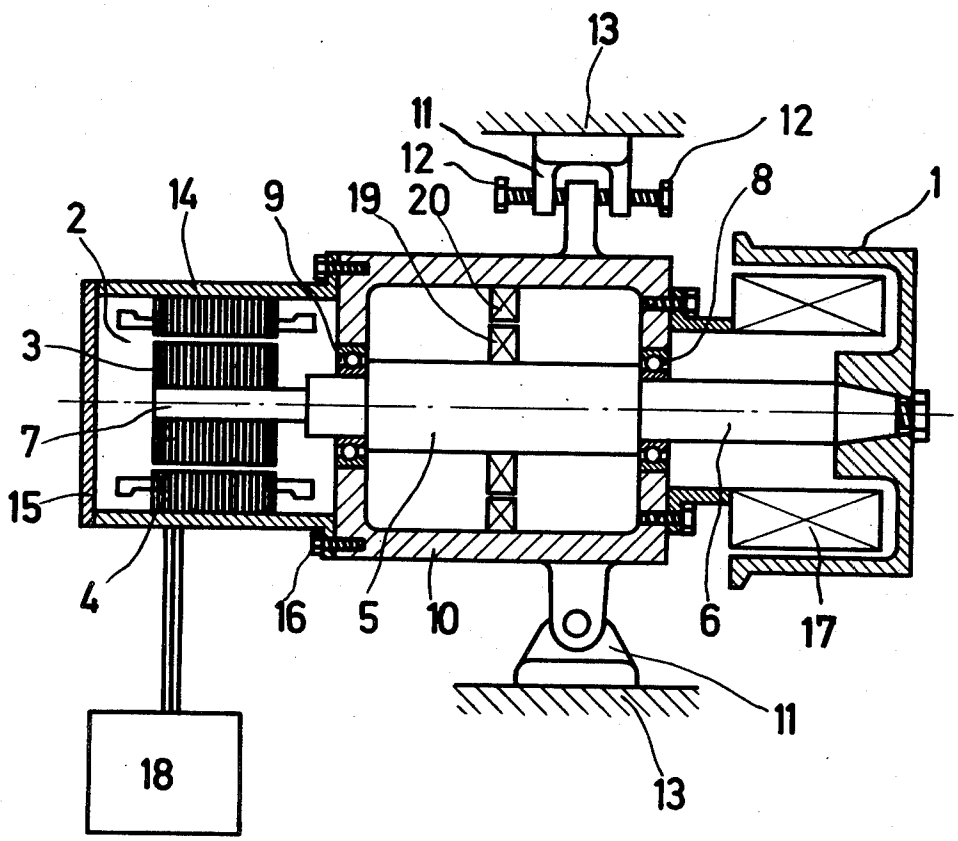
Primary Examiner—Michael J. Keenan

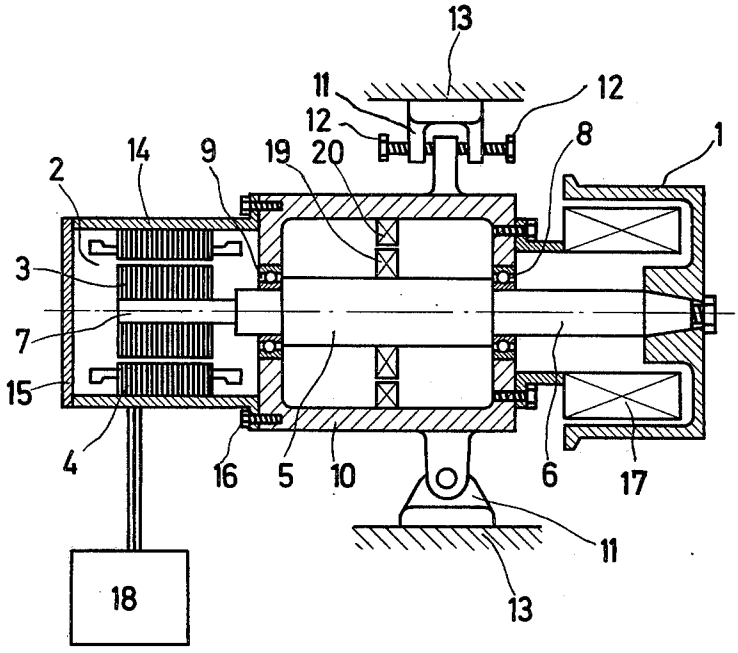
Attorney, Agent, or Firm—Kenyon & Kenyon Reilly Carr & Chapin

[57] **ABSTRACT**

The drawroll arrangement uses a common shaft to mount the godet and rotor of the drive motor for rotating the godet. Both the godet and rotor are mounted in cantilevered fashion. The stator of the drive motor is also detachably mounted on the bearing housing for the shaft bearings.

4 Claims, 1 Drawing Figure




13
11
12
12
8
1
2
14
9
19
20
3
7
15
4
16
5
10
6
17
11
18
13

DRAWROLL ARRANGEMENT

This invention relates to a drawroll arrangement and particularly a drawroll arrangement used on draw-winding machines, spin-draw-winding machines and draw-twisting machines.

Presently, on draw-winding machines, spin-draw-winding machines and draw-twisting machines, the drawrolls frequently are each driven by an individual motor. As a rule, each motor is mounted on the machine frame and is provided with a free rotor shaft journal onto which the drawroll is mounted in a manner similar to a directly mounted belt pulley (e.g. as shown in German Disclosure 1,760,627 and German GM 70, 32, **345**, as well as Swiss Pat. Nos. 492,809 and 465,127). The rotor of the drive motor and the drawroll thus are fixed on the same axle which is rotatably supported in so-called bearing end plates at both ends of a stator housing of the motor. Such an arrangement has an advantage in providing a relatively short construction length. The trend, however, towards ever higher production rates per winding or twisting position, not only requires correspondingly increased rotational speeds of the drawrolls, but also correspondingly increased heating capacity for the individual drawrolls. Thus, in the above-mentioned arrangement, the ever increasing heater capacity needed creates a problem in that the drive motors become exposed to an increasing additional heating. This is particularly detrimental to the motor coils.

Other draw-winding, spin-draw-winding and draw-twisting machines are also known in which a heated godet or drawroll is mounted on one end of a drive shaft which is rotatably supported by two bearings while a gear is provided for transmitting the drive power at the other end or between the bearings of the shaft (as described in German AS 1,615,453, U.S. Pat. Nos. 3,463,893 and 3,296,418, British Pat. No. 989,349 as well as French Pat. No. 1,495,882). Such arrangements, however, have a disadvantage in that the position of the godet shaft, once chosen, is rigidly determined and cannot be adapted for any adjustments which might be needed later on.

Still other arrangements are also known in which a heated godet or drawroll is mounted on one end of a drive shaft while a coupling member is provided at the other end for transmitting the drive power. The drive power, in this case, as a rule, is supplied by an individual drive motor of a known construction which is equipped with two bearings for the motor rotor shaft while one end of the shaft is provided with a coupling member corresponding to the coupling member mounted onto the godet shaft. As this arrangement necessitates the use of a coupling and four bearings, a relatively complex and expensive construction results (German GM 70, 29, 962 and 70, 29, 963).

Accordingly, it is an object of the invention to reduce the number of bearings required in a drawroll arrangement.

It is another object of the invention to reduce the heating effect of a heated godet on a motor of a drawroll arrangement.

It is another object of the invention to avoid the use of coupling member between a drive motor shaft and a godet shaft.

Briefly, the invention provides a drawroll arrangement for draw-winding, spin-draw-winding and draw-twisting machines having a common rotatable shaft on which a godet is mounted in cantilevered fashion at one end and a rotor of a drive motor for driving the godet is mounted in cantilevered fashion at the other end. In addition, the common shaft for directly transmitting the drive force from the motor to the godet is rotatably supported by two bearings within a housing situated between the godet and drive motor.

These and other objects and advantages of the invention will become more apparent from the following detailed description and appended claims taken in conjunction with the accompanying drawing in which:

The drawing illustrates a cross-sectional view of a drawroll arrangement according to the invention.

Referring to the drawing, the drawroll arrangement substantially comprises a heated or unheated godet **1** constructed as a drawroll and a drive motor **2** with a rotor **3** and stator **4.** The godet **1** and the rotor **3** are mounted on a common shaft **5** which directly transmits a drive force from the motor **2** onto the godet **1.** For this purpose, the shaft **5** is provided with a journal **6, 7** of any suitable type at each end. Thus e.g. the journal **6** for the godet **1** can be provided as usual with a conical end portion facilitating the exchange of the godet **1** and the journal **7** is chosen to be of cylindrical nature with the rotor **3** press-fitted thereon.

The shaft **5** is rotatably supported by two bearings **8,** 9 arranged between the two shaft journals **6, 7** or the godet **1** and the rotor **3** respectively, in such manner that each of the two shaft journals **6, 7** extends outward from the bearings **8** and **9,** respectively, in cantilevered fashion. Both bearings **8, 9** are arranged in a pair of end walls of a common bearing housing **10.** The bearing housing **10** is provided with suitable mounting means **11** and is mounted on a machine frame **13,** for example, by means of mounting screws **12,** in order to be adjustably and detachably arranged. As shown, the godet is mounted exteriorly of the housing **10.**

The stator **4** of the drive motor **2** is also arranged in a separate motor housing **14,** the outside of which is closed by a cover end plate **15** which is detachably mounted on the face side. The stator **4** is secured to the housing **14.** The cover end plate **15** is void of any bearing for the shaft **5.** The other face side of the housing **14** opposite to the end plate cover **15** is provided with a mounting flange, mounting supports or, e.g. merely with bores parallel to the axis for detachably mounting the stator **4** and housing **14** exteriorly on the bearing housing **10** by means of screws **16.**

If heated godets **1** are used, the heating can be effected by a heating device **17** of any type as chosen, such as e.g. by a resistance heater or by an inductive heater.

In order to provide adjustability of the rotational speed of the godet **1,** a supply of preferably multiphase alternating current of controllable frequency is supplied by a suitable supply device **18,** e.g. a controllable frequency invertor. Furthermore, in the space betwen the two bearings **8, 9** in the housing **10** e.g. an inductive measuring value transducer is provided consisting of a rotating induction coil **19** mounted on the shaft **6** and of a stationary induction coil **20** mounted in the housing **10.**

A considerable advantage of the inventive drawroll arrangement is that the two bearings arranged in the end plates of normal drive motors, which would otherwise be needed if such motors are used, are eliminated.

A further advantage is that, if heated godets **1** are used, the distance between the godet **1** and the drive motor **2** is enlarged. This considerably reduces the heating of the motor **2.** Furthermore, no coupling members are needed between the motor shaft and godet shaft. As opposed to gear train arrangements, the rotational speeds of the drawroll of a whole machine for processing different material types and for different processing characteristics can be divided freely into groups or individually and can be controlled in groups or individually.

A further advantage of the drawroll arrangement is that the shaft diameter between the bearings **8, 9** and the distance between the bearings **8, 9** can be chosen as desired. In previous constructions wherein a motor is arranged between bearings, the shaft diameter between the bearings has been limited by the motor rotor. These two values, namely, shaft diameter between the bearings and the distance between the bearings, which are also determining factors of the critical rotational speed of the drawroll arrangement, allow the drawroll arrangement according to the invention to be laid out optimally in this respect. Furthermore, the space between the bearings **8, 9** can be used for the arrangement of a measuring value transducer for transmitting a signal supplied e.g. by a temperature measuring gauge mounted within the drawroll.

What is claimed is:

1. A drawroll arrangement comprising

a machine frame;

a shaft;

a godet mounted on one end of said shaft;

a drive motor mounted at the opposite end of said shaft, said motor having a rotor secured on said opposite shaft end;

a bearing housing axially adjustably mounted on said machine frame and including a pair of end walls; and

a pair of bearings each mounted in a respective one of said housing end walls and rotatably supporting said shaft with said ends disposed in cantilevered fashion.

2. A drawroll arrangement as set forth in claim **1** wherein said rotor is press-fitted onto said shaft end.

3. A drawroll arrangement as set forth in claim **1** wherein said drive motor includes a stator housing detachably secured to said bearing housing.

4. A drawroll arrangement comprising

a machine frame,

a bearing housing axially adjustably mounted on said machine frame and including a pair of end walls,

a pair of bearings arranged in said end walls of said bearing housing,

a shaft rotatably supported in said bearings and having a journal at each end extending outwards from a respective one of said bearings,

a motor housing secured exteriorly to said bearing housing,

a drive motor within said motor housing having a rotor mounted on one of said journals of said shaft and a stator secured to said motor housing, and

a godet mounted on the other of said journals exteriorly of said bearing housing.

* * * * *