

(12) **UK Patent Application** (19) **GB** (11) **2 197 956** (13) **A**

(43) Application published 2 Jun 1988

(21) Application No 8627633

(22) Date of filing 19 Nov 1986

(71) Applicant
Wai Sun Leung
Rosebank, Handcross Road,
Staplefield, Haywards Heath,
W. Sussex, RH17 6EJ

(72) Inventor
Wai Sun Leung

(74) Agent and/or Address for Service
Wai Sun Leung
c/o Dr. MW Bentley,
Rosebank, Handcross Road,
Staplefield, Haywards Heath,
W. Sussex, RH17 6EJ

(51) INT CL*
G01L 3/00

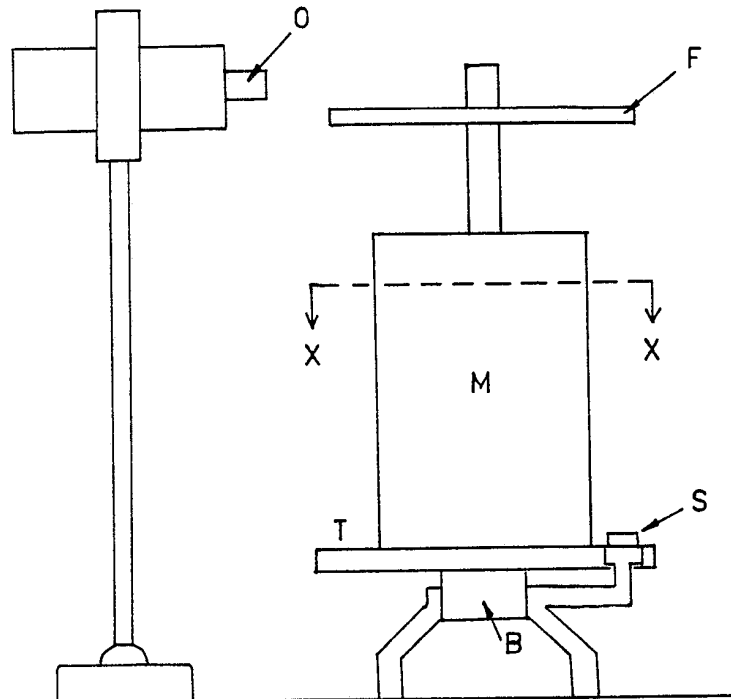
(52) Domestic classification (Edition J):
G1N 1A2P 1A3B 1B1 1D2B 1F 3S1A 3S3 3V2 4E
7E1 7J AAJ ACE
U1S 2047 G1N

(56) Documents cited
GB A 2127549

(58) Field of search
G1N
Selected US specifications from IPC sub-classes
G01L

(54) **Motor torque measuring and recording system**

(57) The invention is an improvement on the British Patent GB 2127549A and relates to a method for mounting a motor to be tested whereby the total testing time (including mounting time) is considerably reduced in a motor production line. The motor M is placed, or held if necessary, on the rubber-covered top of a turn-table T. The turn-table, which rests on a bearing B, is prevented from turning by a static strain gauge S which measures the dynamic torque of the motor at starting. An optical tacho O measures the speed of the motor, and both the torque and speed voltage signals are fed to a recorder to plot the torque-speed characteristic of the motor over the full range of motor speed.



ELEVATION

Fig. 2

GB 2 197 956 A

2197956

1/2

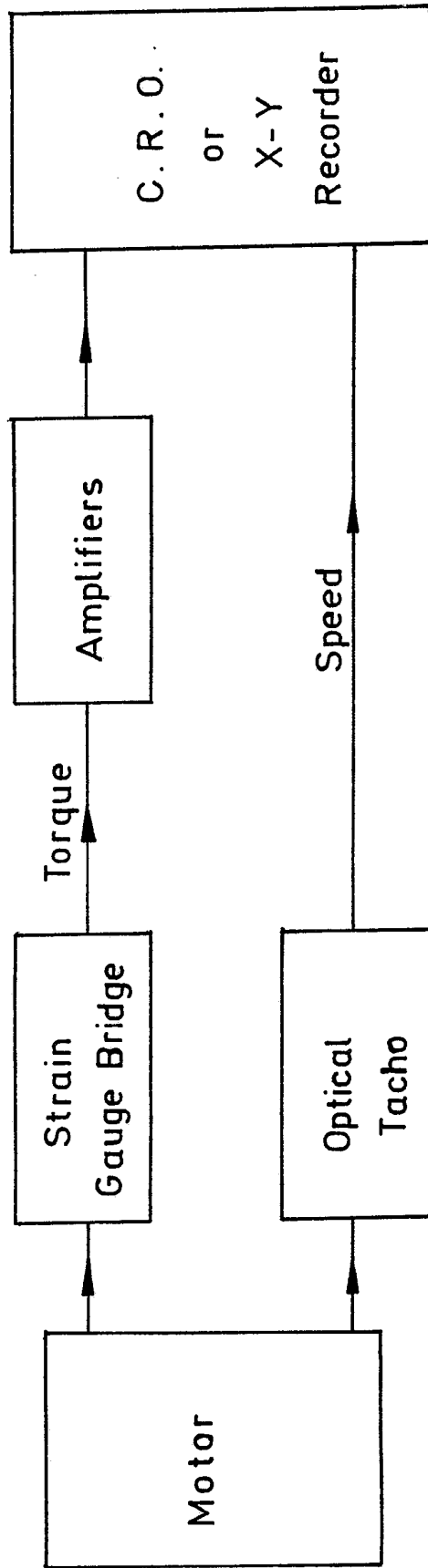


Fig. 1

2197956

2 / 2

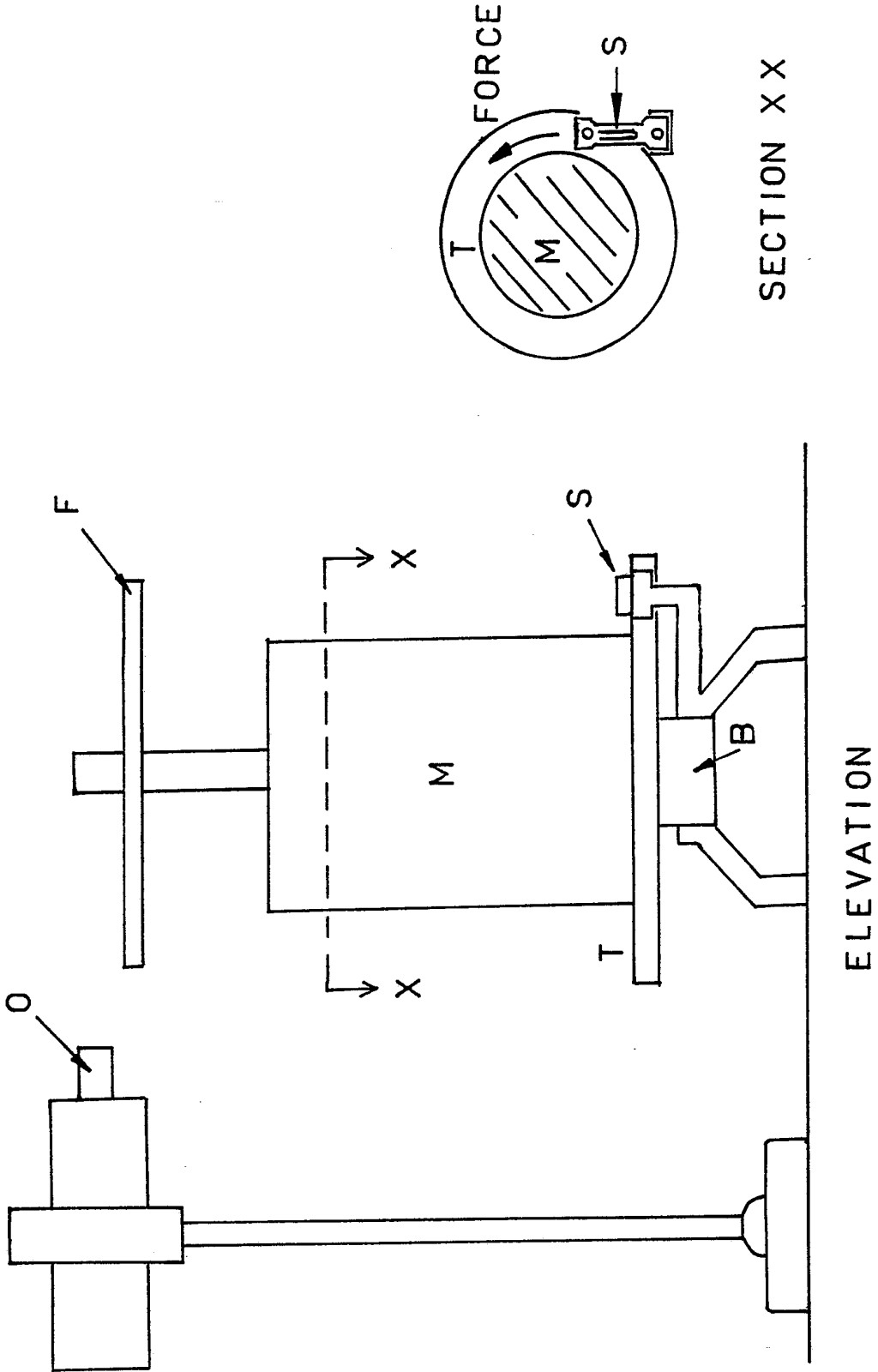


Fig. 2

The invention describes a motor torque measuring and recording system whose block diagram is shown in Fig. 1. When the motor is switched on, the motor accelerates from zero speed to full speed. During the starting period of the motor, the torque and speed of the motor are picked up by a strain gauge and an optical tacho respectively. The voltage signal of the motor torque from a strain gauge bridge and amplifiers and the voltage signal of the motor speed from the optical tacho are fed to the two axes of a recorder such as an C.R.O. and X-Y Recorder. The static torque measured is the generated dynamic torque of the motor. During the starting period, the acceleration of the motor serves as the load of the motor so that it is possible to obtain the full motor torque-speed characteristic, i.e. the motor load characteristic without giving the motor any load. This part of the system follows the inventor's British Patent 2127549A. What is new in the invention lies in the mounting of the motor as shown in Fig. 2. In the elevation, the motor, M, is placed vertically on a turn-table, T, with the shaft of the motor facing upwards. The top of the turn-table, T, rests on a bearing, B, and is capable of turning. However, it is prevented from turning by a horizontally-mounted strain gauge, S. The strain gauge, S, is so positioned as to be tangential to the turn-table, T. The top of the turn-table, T, is fitted with a rubber sheet to provide friction between the top of the turn-table and the base of the vertical motor. For a normal single-phase induction motor, for example, this friction is sufficient to prevent the motor base from slipping on the top of the

turn-table when the motor accelerates from zero speed to full speed. (For a motor with a higher starting torque, the motor may have to be secured more firmly on to the top of the turn-table). A flywheel, F, is fitted to the motor shaft to increase the inertia and stability of the motor during starting. When the motor is switched on, the motor accelerates from zero speed to full speed. The motor frame's reaction torque is transmitted by the base of the motor to the turn-table, T. However, the turn-table, T, is prevented from turning by the strain gauge, S, shown also on the section view of XX. The tension in the strain gauge, S, will produce a voltage signal in the strain gauge bridge proportional to the torque of the motor. During the starting of the motor, the speed of the motor is also measured by the optical tacho, O. Both the torque and speed voltage signals are simultaneously fed to a recorder to plot the torque-speed characteristic of the motor directly over the full range of the motor speed from zero speed to full speed.

Claims

1. A new motor testing system which is an improved modification of the British Patent GB 2127549A with the new feature that the motor is placed, or held if necessary, vertically on a turn-table whose rubber-covered top rests on a bearing and which is capable of turning but is prevented from doing so by a static strain gauge which measures the dynamic torque of the motor at starting.

2. A new motor testing system as described in Claim 1 such that the elaborate mounting and balancing of the test motor described in British Patent GB 2127549A is eliminated by the changing of the positioning of the test motor from the horizontal position to the vertical position and thus reducing considerably the time for mounting and testing a motor and making the system also suitable for use in a motor production line.