

PACKING MACHINE UPM-3M



User Manual

**Moscow, Russia
2008**

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1. Introduction

1.1 This user manual is an official document for study of the mechanism of Packing Machine UPM-3M (hereinafter – **the device**), of its operating principles and maintenance.

PERFORMANCE ATTRIBUTES OF UPM-3M

Dimensions: length, mm	1600
width, mm	760
height, mm	1270
Weight: net, kg	180
set with package, kg	300
Power supply	Battery 12V, 75A*h
Adjustable revolution number of turntable (electronic)	1-9
Maximal revolution rate of turntable	22 rpm
Electronic non-nullable fiscal counter	0-999999999
Average power consumption during packing	120 W
Average standby power consumption	0.5 W
Operation	1 person
Average packing time for one piece of luggage, min	1.0-1.5
Film consumption (per roll)	300-350 packages
Noise level	Less than 55 dB

Note: maximal dimensions of luggage – 1500*800*1000 mm, maximal weight – 70 kg.

LIST OF EQUIPMENT

1. Packing Machine UPM-3M	1 pc.
2. Polyethylene stretch film	1 roll
3. Scotch tape	2 pc.
4. Dispenser	1 pc.
5. Charger	1 pc.
6. Battery	1 pc.
7. Fuses	3 pcs.
8. Equipment certificate	1 pc.
9. Operator Manual	1 pc.
10. Operation Log	1 pc.
11. User Manual	1 pc.
12. Installation Guide	1 pc.
13. Bulb 12 V 0.3 W	1 pc.
14. '+' button, green	1 pc.
15. '-' button, red	1 pc.

2. PURPOSE

2.1 The packing machine is designed for packing of luggage (suitcases, bags, boxes, etc.) into plastic stretch film. The machines are used in passenger customers services, freight terminals and store holders.

2.2 The device is used for packing of any solid object lighter than 75 kg, to protect its contents and appearance during shipping by ground, sea or air transport, and during storage in warehouses.

2.3 The device is operated at atmospheric temperature 0-40°C, relative humidity 80% (at 20°C).

3. MECHANISM AND OPERATION PRINCIPLE

3.1 Description of the device

The device (**Fig. 1**) consists of a cabinet and a trolley.

The cabinet is a welded case-shaped construction. There are two doors in the rear wall. The upper lid opens to driving gear. Inside, there are mechanism of film pre-stretching (for preliminary stretching of film up to 200%), turnable cassette for guiding and fixation of the film bobbin, and electronic control board. Film pre-stretching rollers are set into the bearing supports fixed on the upper and lower plates of pre-stretching mechanism. The plates are tied by the bars fixed on the trolley. A bobbin with polyethylene film is settled on the turnable cassette with the clamping spring. At the bottom, there is a tray for battery.

Feeding and preliminary film stretching are carried out by rollers propelled by chain drive and pinions located under the upper lid of the device. The chain is driven by the motor with speed regulation.

The degree of preliminary film stretching depends on revolution rate of the rollers.

The trolley is a welded box-shaped cover made of stainless steel. The cabinet and the turntable are set on the trolley.

The turntable bears against the supporting rollers fixed on the trolley.

The turntable is driven by the motor with speed regulation.

The trolley rests on three wheels. The front wheel is turnable and equipped with brake.

The power is supplied by battery (capacity not less than 75 A*h) or by stabilized power supply (optional). The battery should be recharged when necessary, but not later than after 8 hours of continuous operation. The provided charger should be used to recharge the battery (in specially designated area).

ATTENTION! To avoid electric injury do not place charger inside the device.

3.2 Operation principle

Luggage packing is carried out using special polyethylene stretch film (stretch factor not less than 2.5). The luggage is placed on the turntable of the device and fixed with clamping holders.

The film is reeled off bobbin by rubber rollers and fed to luggage through the guiding (outlet) roller. Film tension (packing compactness) is regulated by the adjustment of revolution rate of the turntable and of the film transport drive.

When the specified number of revolutions is achieved, the turntable stops, and the film is cut by the tearoff knife located on the front wall of the device, near the guiding roller.



Fig. 1. UPM-3

4. SAFETY PRECAUTIONS

4.1 Only persons older than 18, who have passed medical examination, orientation training, safety training, electricity safety knowledge test, and special safety working instruction, and who have studied mechanism and operational principles of the device, are allowed to unrestricted work with the device.

IT IS STRICTLY PROHIBITED:

- to carry out regulatory and fastening works on the running device;
- to open cabinet lid on the running device;
- to charge battery on the running device.

5. MACHINE DIAGRAM (see Fig. 2)

1. Chassis.
2. Wheel.
3. Turnable wheel with brake.
4. Case.
5. Film bobbin bearing.
6. Film.
7. Spring-mounted turning arm.
8. Rubber rollers.
Driving pinions:
 9. $Z=16$;
 10. $Z=36$;
 11. $Z=12$.
12. Driving roller.
13. Guiding roller.
14. Battery.
15. Regulation handle of film bobbin fastening.
16. Operation panel.
17. Control panel.
18. Expansible holders.
19. Turntable engine.
20. Turntable.
21. Brake.
22. Film pre-stretching engine.
23. Screws for turntable fastening.

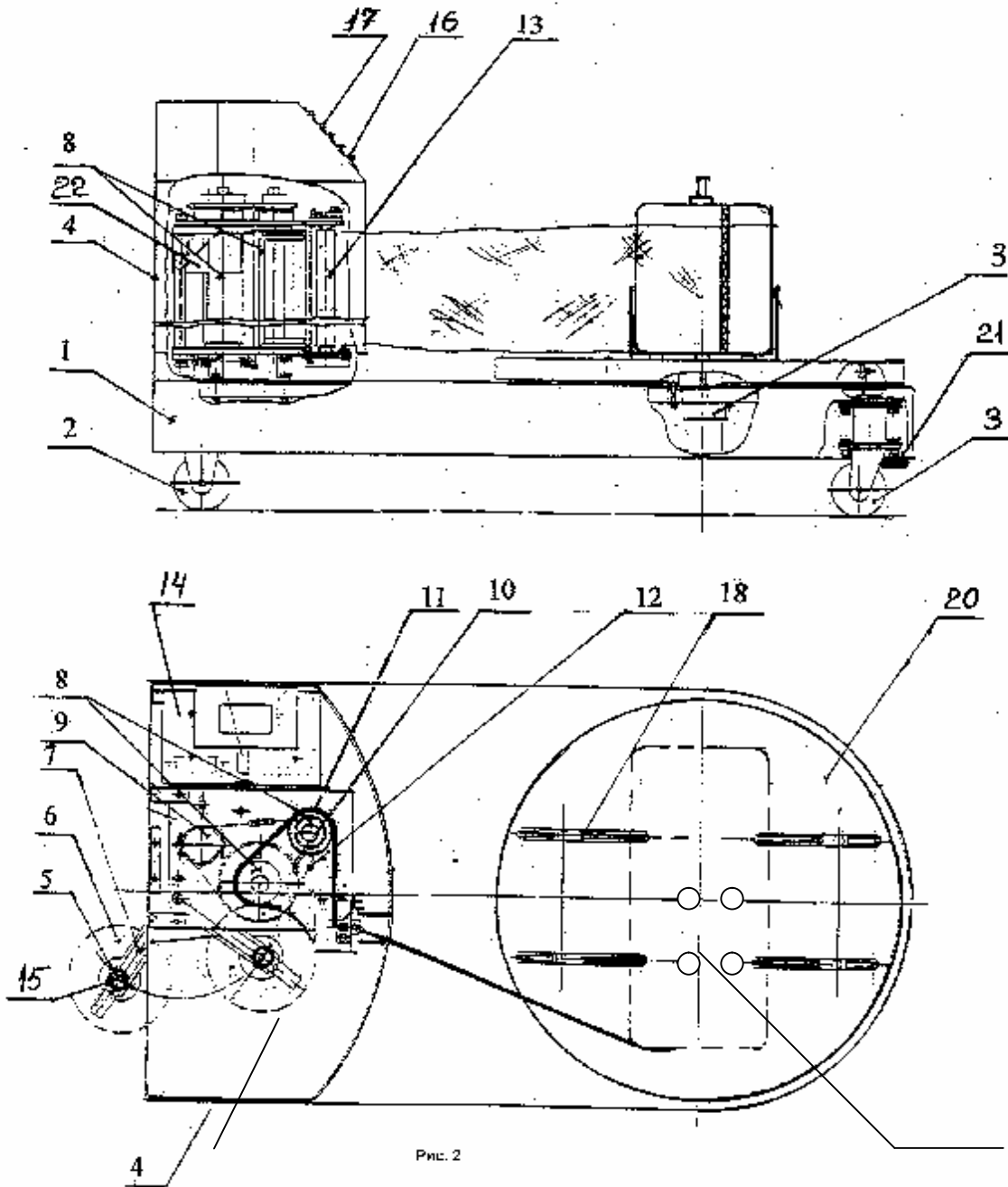


Fig. 2. Machine Diagram

6. INSTALLATION AND OPERATION

6.1 Before start, operator must put on workwear and visually check condition of the device and availability of the operating supply.

6.2 Install a bobbin with film into the cassette:

- a). Pull the bearing (4, Fig. 2) until it is fixed;
- b). By turning the screw, lift the film clamping until the film roll freely enters under the clamping roller (7, Fig. 2);
- c). Place the bobbin with film on the lower bearing (4) so that when the film is unwinding, the roll is turning counter-clockwise; then secure the screw (7) to fix the bobbin;
- d). Push the bobbin inside the device;
- e). Unwind approximately 1 meter of film and place it (see Fig. 2) between two rubber rollers, so that the film covers them on the outer side; lead the film out through the steel outlet roller and through the slot in the front wall of the cabinet. When the film is in tension, the outlet roller should move with it, deflecting from vertical axis.

ATTENTION! The film whipping is strictly prohibited – it can lead to adhesion of film to the bobbin and following winding on the rubber roller.

In the case the film has winded on the rubber roller:

- **turn the device off by “Emergency Shutdown” button, or “Off” toggle switch located inside the device, behind the right door;**
- **release the rubber roller from winded film by turning the roller manually in the direction opposite to winding;**
- **reinstall film into the device (see 6.2e);**
- **turn the device on by “On” toggle switch or “Emergency Shutdown” button by turning it counter-clockwise;**
- **fix the film edge on the tearoff knife by winding film around the knife.**

6.3 To carry out the electromechanical check, as well as to operate the device:

- a) Check the reliability of the battery contacts and polarity: red clip on the “+” clamp, black clip on the “-” clamp;
- b) The battery must be fully charged; if it is uncharged, use the charger included in the delivery set, according to operating manual;
- c) Turn the device on by “On” toggle switch. The device will be initialized, the revolution counter will be set to the starting value “4”, the fiscal counter will display the last stored number.

6.4 Place the luggage in the center of the turntable (20, Fig. 2).

ATTENTION! The packing luggage must meet the following requirements:

- **dimensions do not exceed the maximum allowed;**
- **weight is not more than 75 kg;**
- **non-fragile object (glass, crystal, etc. are not allowed);**
- **non-crumplable object (thin paper boxes, etc. are not allowed);**
- **no sharp, protrudent edges (it can result in film tearing).**

6.5 By bringing the expansible holders apart or together, press them to the packing luggage. It is highly recommended to move holders by laying stress on their lower part - to provide the smooth motion, to decrease the exertion applied and to decrease the probability to break the holders.

6.6 Depending on dimensions and weight of luggage, set the appropriate number of turns using “+” (green) or “-” (red) buttons. Please note that maximum number of turns is 9.

6.7 Pull the film out, press its edge to the lower part of the nearest holder and press the “Start” button; decimal point of turn number display and “Start-Stop” button will be highlighted. After that, turntable starts to turn (the turn number indicator will show the number of revolutions remaining before stop).

6.8 If needed, operator can force the turntable to stop by pressing the “Stop” button (decimal point will blink signaling that the machine is in the “PAUSE” mode; to switch to the full stop mode operator should press the “STOP” button once again). To continue packing from the point of interruption, press the “Start” button.

6.9 Upon reaching the “0” position (after the specified number of turns is done), the table will stop, and the turn number counter will return to the last value set by operator. Note that if during the forced stop operator changes the counter state by pressing “+” or “-” buttons, then, when the working cycle is over, the counter will return to the value set before the beginning of the cycle.

6.10 Pack the luggage from one side, then turn it over (do not cut the film!) and continue packing from the other side. When packing is finished, cut the film. Fix the film edges by Scotch tape using dispenser.

Note: Usually, 3-4 film layers are enough for appropriate packing.

6.11 Take the luggage off and cut holes for handles and wheels. If there are no handles, tie polypropylene cord round the luggage.

6.12 The power supply of the device is provided by battery (10-12 hours without recharging, 20-25 packages per hour). The recharging should be carried out during work breaks.

6.13 When operation is over, turn the device off by the “Off” toggle switch.

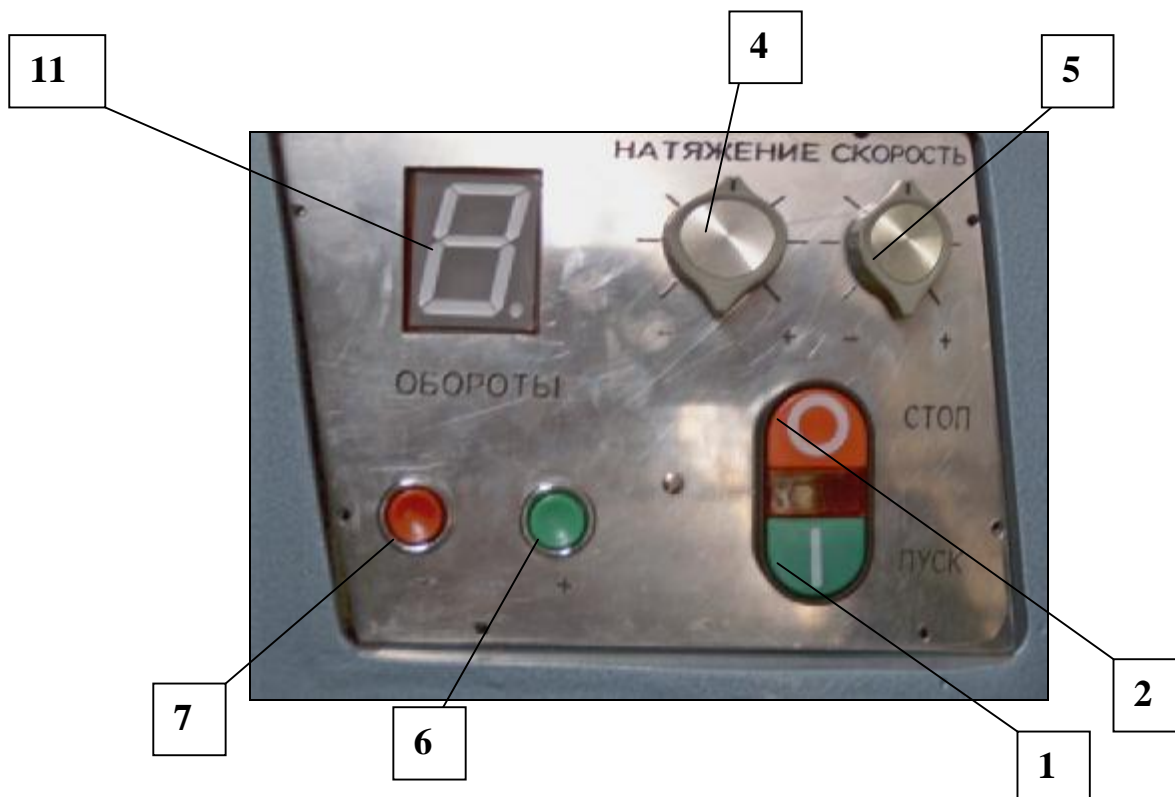
ATTENTION! In case of emergency, turn the device off by the “Emergency Shutdown” button and call your administrator.

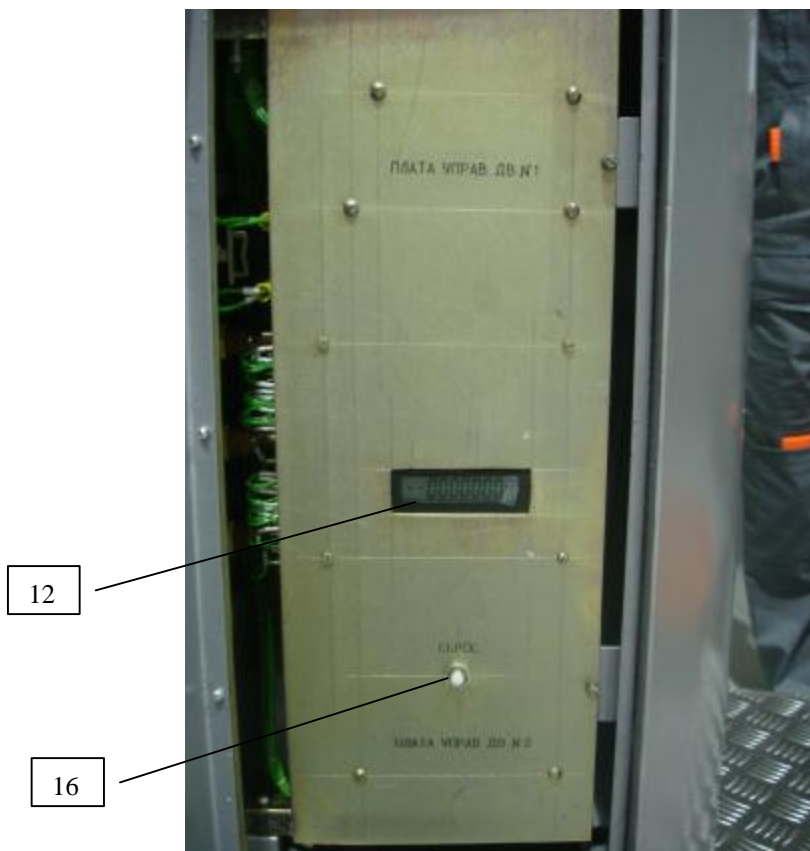
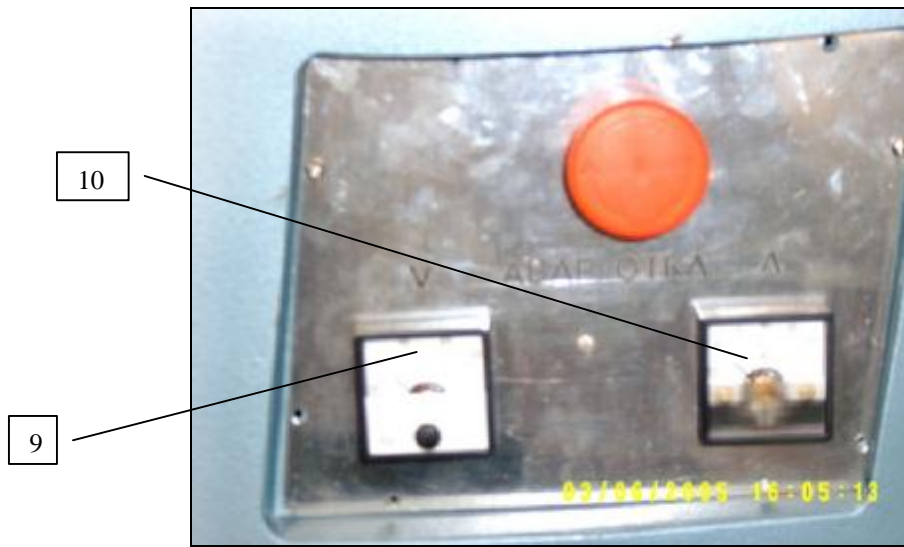
7. HANDLING

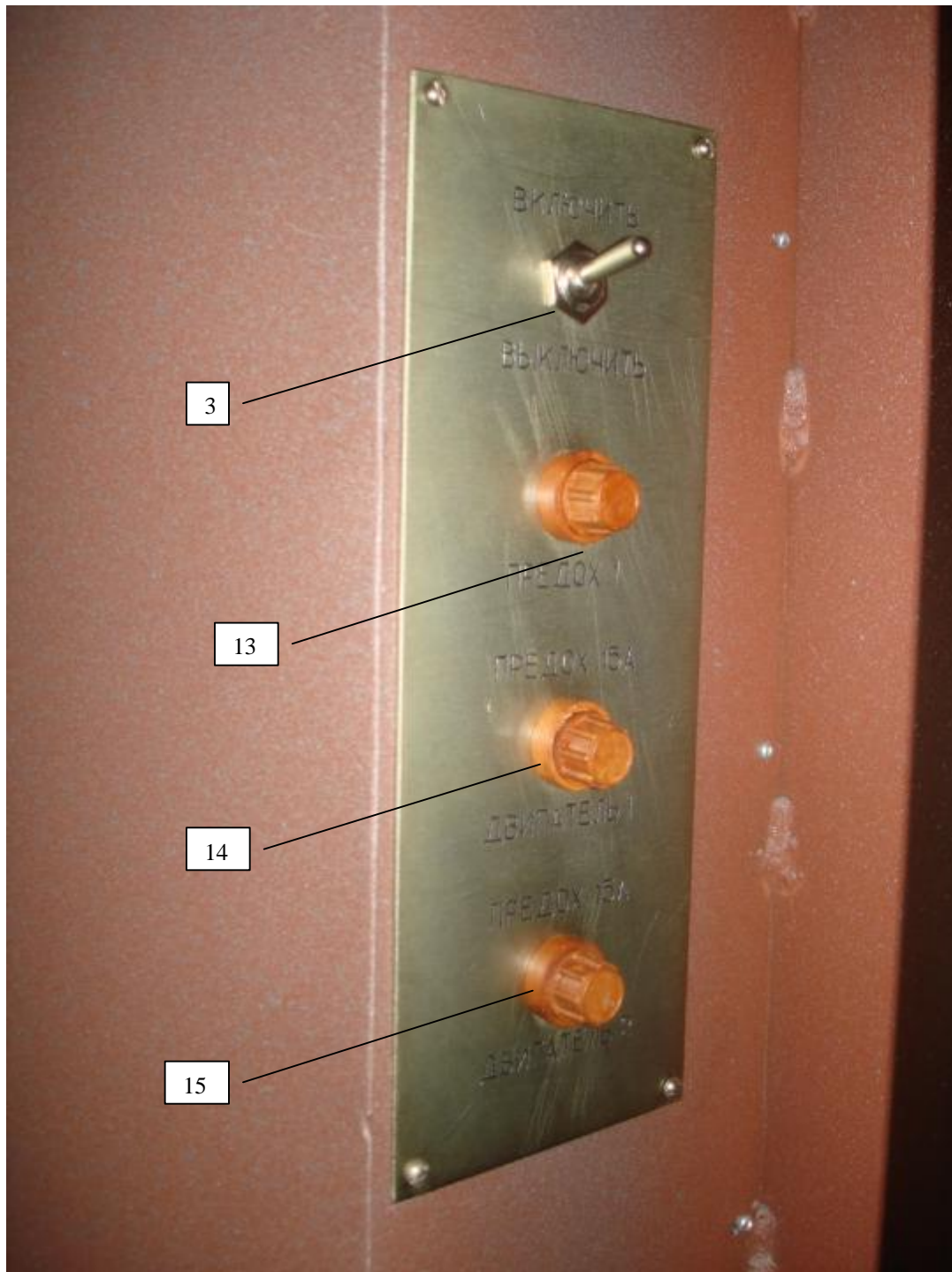
1. "Start" button.
2. "Stop" button.
3. "On-Off" toggle switch.
4. Film tension regulator.
5. Turntable revolution rate regulator.
6. Increase of turntable turn number.
7. Decrease of turntable turn number.
8. "Emergency Shutdown" button.

8. CONTROL

9. Voltmeter, battery voltage control (not less than 10V).
10. Ammeter, current consumption control (not more than 20A).
11. Turntable turn number indicator (0-9).
12. Non-nullable fiscal counter.
13. Counter board fuse (2A).
14. Turntable engine control board fuse (15A).
15. Pre-stretching roller engine control board fuse (15A).
16. "Reset" button, nulling of running hours per shift.







9. FINISHING OPERATION

Upon finishing the operation:

- press the “Stop” button;
- turn power off by the “On-Off” toggle switch;
- charge the battery, if necessary;
- close the doors and lock them;
- wipe the device by wet duster.

10. FISCAL COUNTER OPERATION

The purpose of a fiscal counter is to count the number of luggage pieces packed. The counter records two values – hours per shift and total running hours. The shift running hour counter records the turntable turn number and, therefore, indirectly reflects number of the luggage pieces packed. The counter is nulled by the button located behind the protecting doors which can be opened by shiftman only. It is highly recommended to null the counter at every shift changeover and to record the counter registration in the operation log.

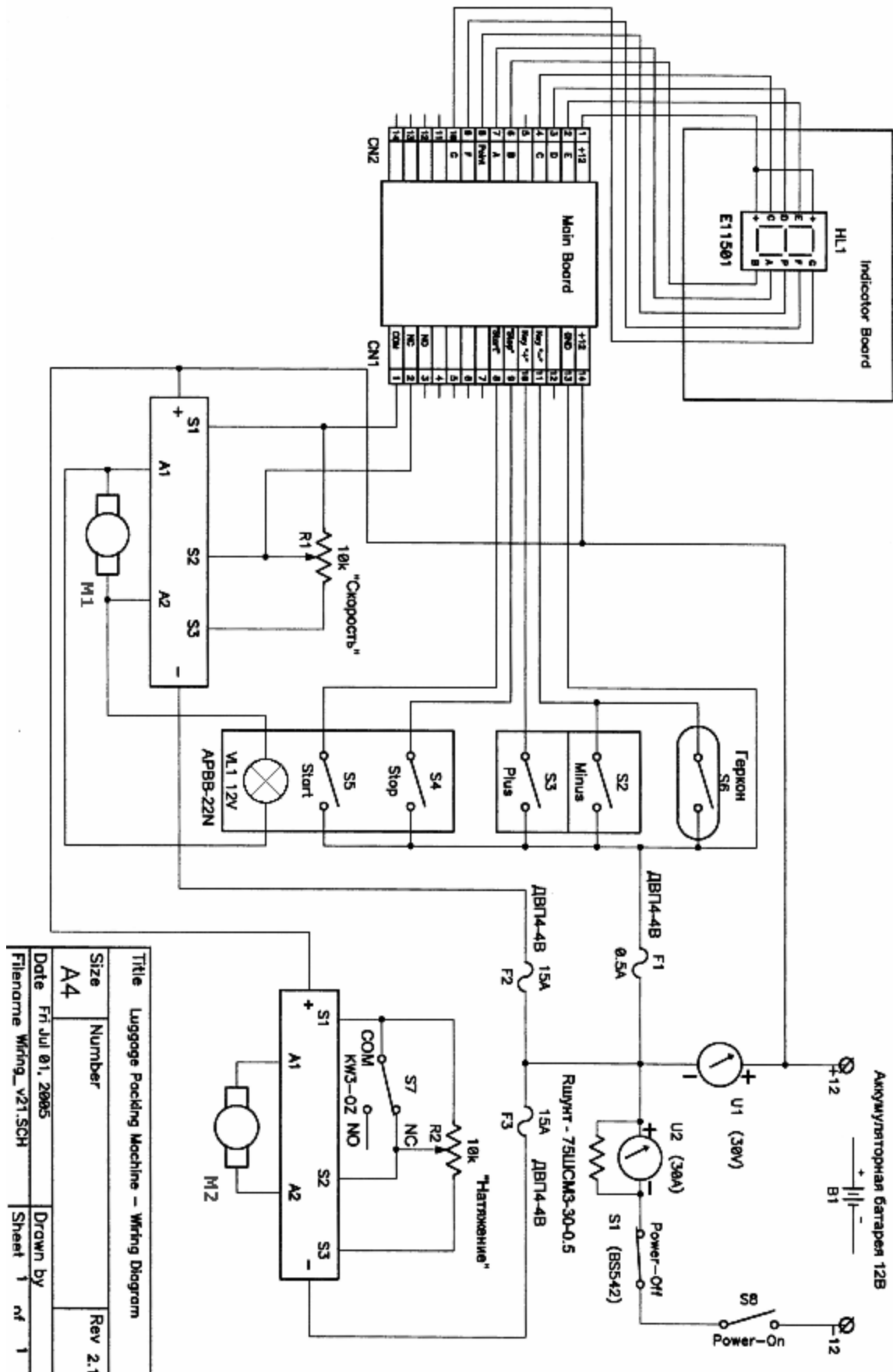
The total running hours counter is non-nullable, its registration can be changed by manufacturer only. To read the total running hours, press the “STOP” button and hold it down for 2-3 seconds. At first, total running hours will be displayed by the turn number indicator. Digits will be displayed sequentially and separated by “-” symbol. (Therefore, to read the total running hours, it is not necessary to see the fiscal counter display). When all digits are displayed on the turn number indicator, data will be displayed on the fiscal counter and will stay displayed until turntable starts or any button is pressed.

10. OPTIONAL EQUIPMENT

Optionally, the device can be equipped with built-in electronic weighing machine for packing tariffing on basis of luggage weight. Weighing terminal is equipped with interface port for PC connection which allows calculation of packing cargos in warehouses.

THE DEVICE CONSTRUCTION IS UPGRADING CONSTANTLY, SO THERE MAY BE INSIGNIFICANT DIFFERENCES NOT REFLECTED IN THIS MANUAL

10. WIRING DIAGRAM



Title		Luggage Packing Machine – Wiring Diagram	
Size	Number	Rev 2.1	
A4			
Date	Fr Jul 01, 2005	Drawn by	
Filename	Wiring_v21.SCH	Sheet	1 of 1