1.0 INTRODUCTION

1.1 SCOPE

1.1.1 This document establishes the method for determining smoothness of paper or card stock.

1.1.2 The smoothness test consists of objectively measuring and placing a numerical value on a paper surface. As the roughness of a paper surface increases, the readings become higher. (Cubic centimeters of air flow/minute over one square inch of paper x 10).

1.2 REFERENCES

1.2.1 Specifications

1.2.1.1 IBM-IRD 7-02-0101 -- Card Stock IBM Information Processing Cards

1.2.1.2 IBM-IRD 7-02-0201 -- 9 Point Data Processing

1.2.1.3 IBM 894502 -- Data Processing Card Stock 7 Point

1.2.1.4 IBM 894507 -- Data Processing Card Stock 9 Point

1.2.2 Standards

1.2.2.1 TAPPI T-402 -- Conditioning Paper and Paperboard for Testing

1.3 AUTHORIZATION

1.3.1 This document is authorized by the IRD Manager of Quality Assurance.

1.4 TEST EQUIPMENT/MATERIAL

1.4.1 Sheffield Precisionaire -- Column Instrument

1.4.2 Sheffield Smoothcheck Fixture

1.4.3 Sheffield Constantaire Regulator

2.0 PROCEDURE

2.1 SAMPLE PREPARATION

2.1.1 The test sample shall consist of 10 standard data processing cards or 10 sheets of paper at least 7-3/8" x 3-1/4".

2.1.2 Environment for conditioning and testing specimen(s) shall be in accordance with TAPPI T-402. (73 ± 3.5°F and 50 ± 2% R.H. for a minimum of two hours.)

3.0 CALIBRATION

NOTE: Smoothness tester should be calibrated every time the air supply is shut off.

3.1 Open the air supply line and adjust pressure to 30 psi.

3.2 Set the manometer to 1.5 psi (refer to Figure 1.).

3.3 Insert one end of plastic tubing into no. 1 quick connect coupling (7) of Precisionaire instrument and other end in no. 1 coupling of test fixture (8).

3.4 Place finger over open orifice on no. 1 connector of fixture (6) and adjust float positioning knob (4) until top of float is adjacent to lower red line.

3.5 Release finger and observe where float stops. If the float travels higher than upper red line on scale, turn calibration screw (5) counter clockwise until float falls approximately an equal distance below the upper red line, then use float positioning knob (4) to raise the float to the upper red line. If the float falls short of upper red line, then turn calibration screw (5) clockwise until float falls approximately an equal distance above upper red line then lower float with positioning knob (4).

3.6 Repeat steps 3.4 and 3.5 until float falls between upper and lower red lines by alternately placing finger over orifice and releasing.

3.7 The same procedure is followed for the other columns by moving plastic tube (7 and 8) to the proper number columns.

3.8 After calibration, check manometer to see that the 1.5 # pressure is still maintained. If not, readjust pressure and recalibrate.

3.9 Clean glass plate and rings at smoothcheck fixture head with soft (lint free) cloth or chamois.

4.0 TEST INSTRUCTIONS

NOTE: Refer to 1.2.1 for actual values to be tested.

4.1 Place plastic tube in middle or unnumbered coupling of the smoothcheck fixture. Place other end of tube in coupling on the column instrument respective to the anticipated reading range. (For card stock, the most common column used will be the center.)

4.2 Place sample on glass plate then lower the testing head onto the sample. (The testing head falls against sample by its own weight.) The lever is used only to raise and lower testing head.

4.3 Note the position the top of the float indicates. Record this figure. Take ten (10) readings on each side of card stock or paper. Average the ten (10) readings of each side separately to determine the smoothness value.

4.4 If float falls below the lower red line in the column being used, move plastic tube coupling (7) to the next column to the right. If float falls above upper red line, move plastic tube coupling (7) to the next column on the left.

5.0 REPORTING

5.1 Determine the average of the ten wire side readings and the 10 felt side readings and report both wire and felt side smoothness.

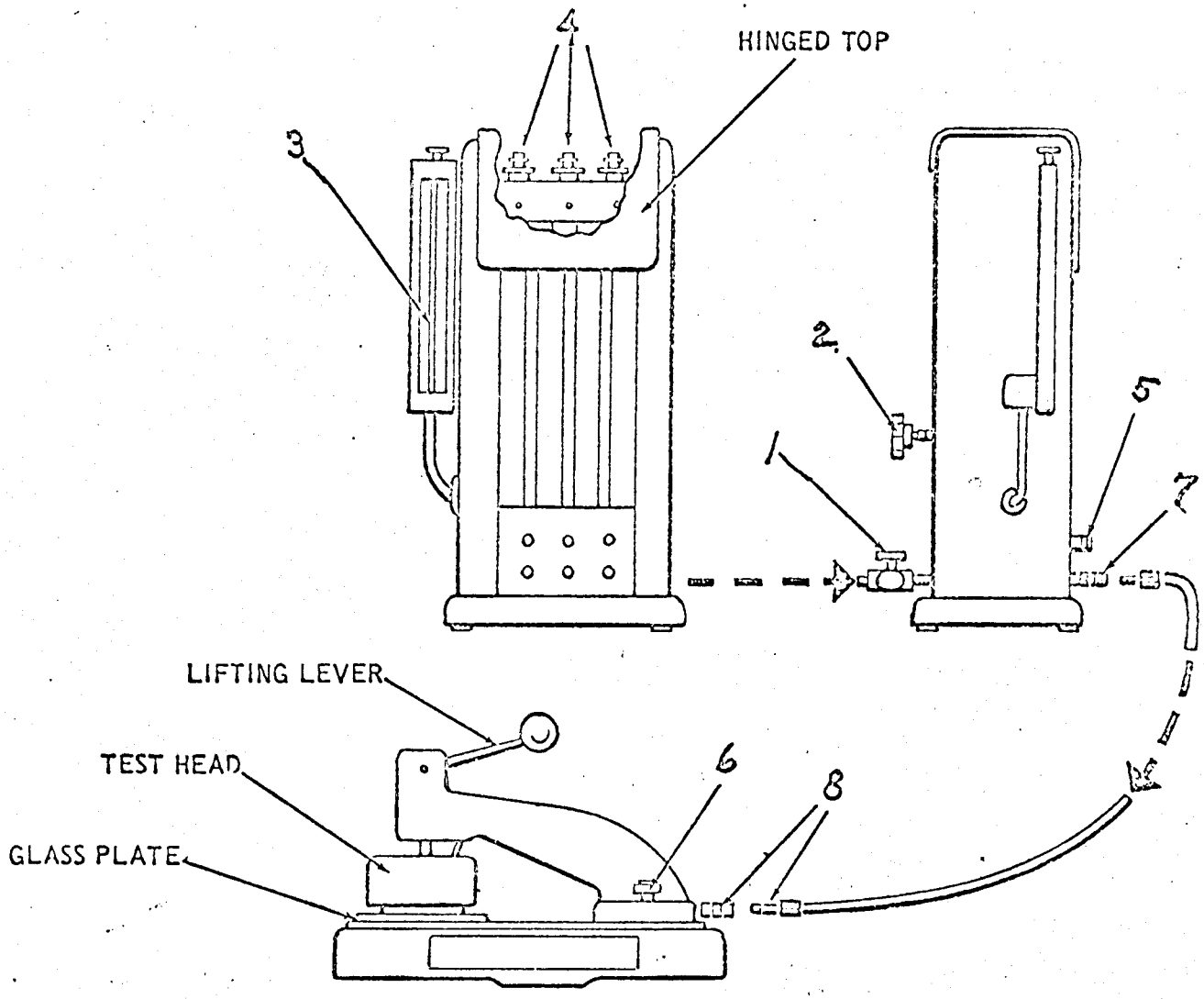

FIGURE 1

1 SHUT OFF VALVE
2 REGULATOR – 1.5#
3 MANOMETER – 1.5#
4 FLOAT POSITIONING KNOBS
5 CALIBRATION SCREW
6 CALIBRATING ORIFICE
7 QUICK-DISCONNECT COUPLING
8 QUICK-DISCONNECT COUPLING