

From Analogue to Digital: Sound Input through the Ages

Music 253/CS 275A
Stanford University

Automatic transcription



1747 (Grove 1)

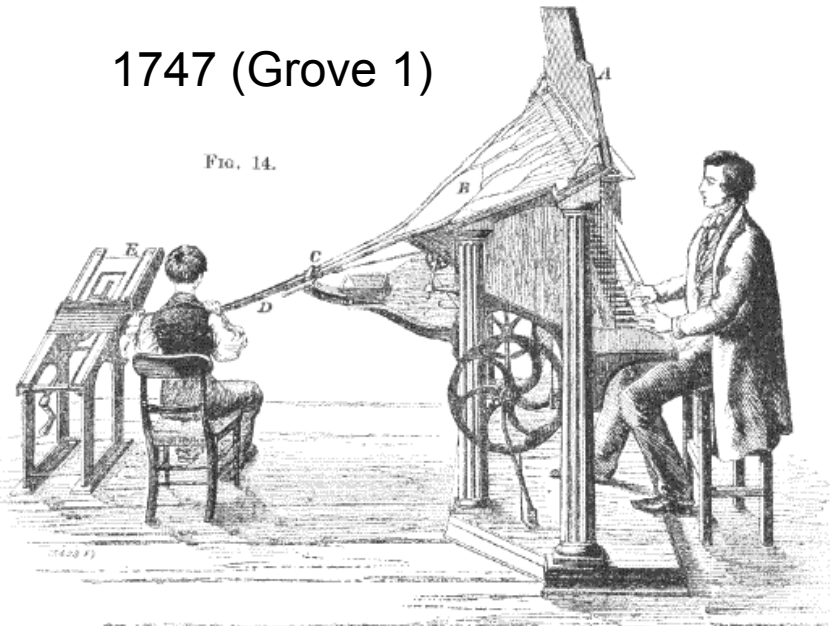


FIG. 14.

FIGS. 12 TO 14. YOUNG'S COMPOSING MACHINE

19th century

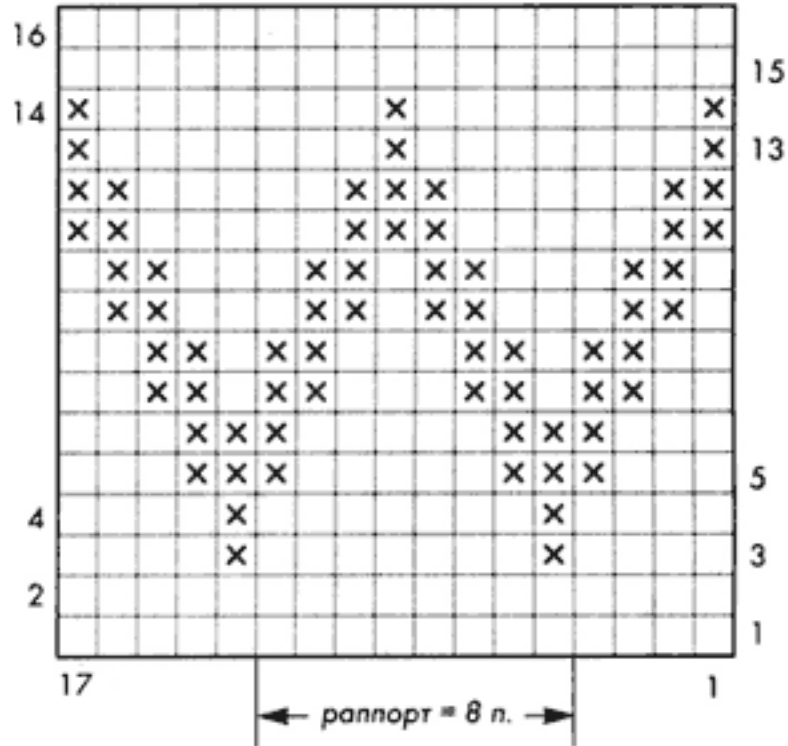
Horizontal loom

Weaving patterns

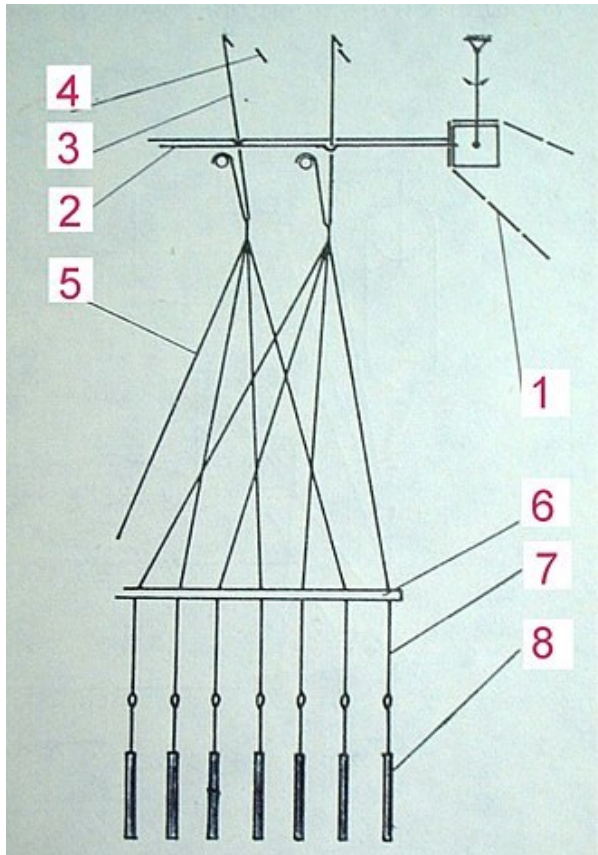


What is the basis of a Jacquard pattern?

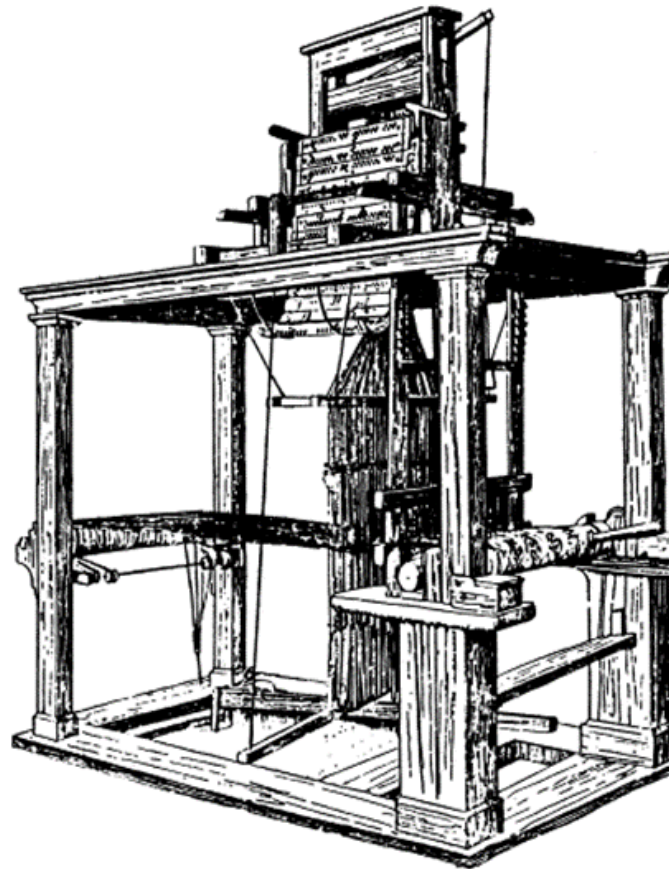
Basic grid, similar to grids for music-typesetting.



Machine weaving



Threading of loom.



Vertical (Jacquard) loom, 1855



Cards for loom.
Rotate as loom turns.

**To change pattern,
change cards.**

Patterns for sound “programs”: Orchestrions

Orchestrion: https://www.youtube.com/watch?v=955mEk_q8hM

Wurlitzer theater organ:

<https://www.youtube.com/watch?v=nbOEKXnNnB8>

Trautonium (Oskar Sala, 1940-60s; Alfred Hitchcock films)

<https://www.youtube.com/watch?v=-tQQEChMq1A>

<https://www.youtube.com/watch?v=-tQQEChMq1A>

Sound generators

Machines to generate sound in order

- to **generate** music [compose or arrange on the fly]
- to **perform** music already composed or arranged
- <https://music.stanford.edu/projects/player-piano-project>
- to **transcribe** music from performance

Organ
(orchestrion?)
roll



<https://www.youtube.com/watch?v=JTnGI6Knw5Q>

Sound generation and capture

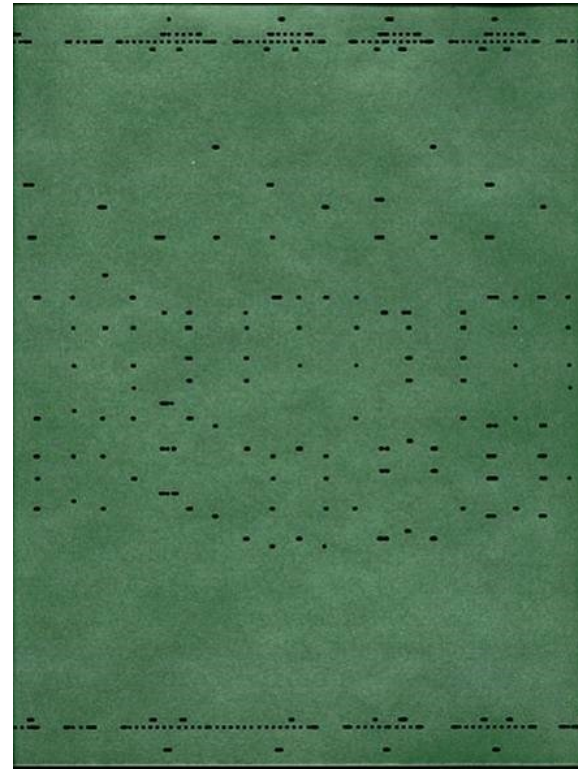
- c.1800 AD



Franklin's Glass Harmonica

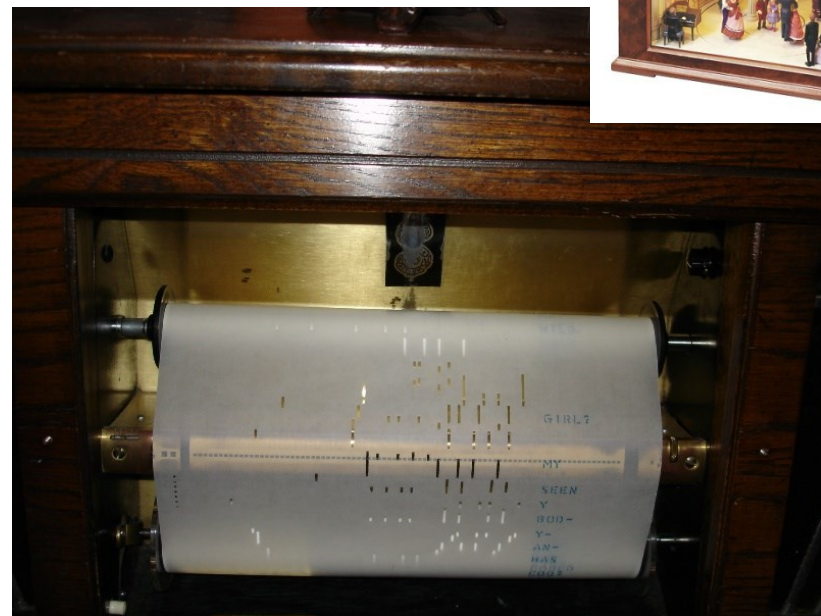
<http://www.youtube.com/watch?v=-WZExmtlJkl>

- c.1905



Welty-Mignon piano roll

Music Boxes and Piano Rolls



<http://www.pianola.co.nz/index.asp>



Reproducing music: Early phonography

Edison home phonograph c. 1914



Edison floor model 1921



Victrola c. 1930



Interfacing hardware to software

Let machines deal with machines
(robotics):



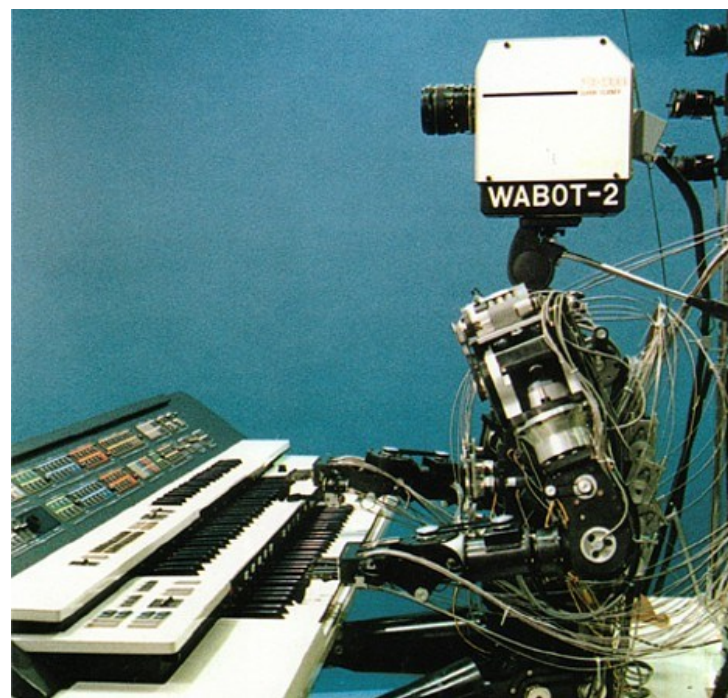
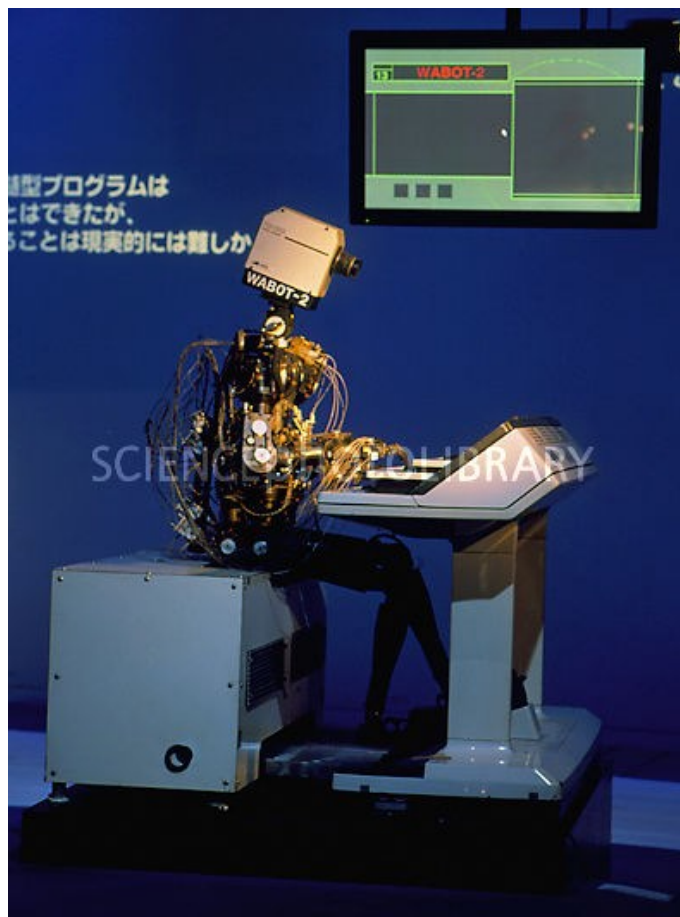
Self-playing tuba

Give users independent control of
different parts of machine:



Wurlitzer band organ

Wabot from Keio University, 1984--



Video:

http://rraj.rsj-web.org/en_atcl/224

Basic properties of MIDI (1983-85)

- Eight-bit architecture
- Files are binary
- Highly standardized



Harmonipan

Street-organ controller

